

**Feasibility of a Clean Bus Tour District in Yellowstone National Park**

by Thomas M. Barron

Transportation Technology & Policy Program

Institute of Transportation Studies in conjunction with Yellowstone National Park

University of California at Davis

Davis, CA 95616

(415) 939-3911

[tmbarron@ucdavis.edu](mailto:tmbarron@ucdavis.edu)

*corresponding author*

**Abstract**

Yellowstone National Park's large size of 2.2 million acres and nearly 3 million annual visitors pose unique transportation planning challenges. These challenges are further compounded by five entrances and twelve major attractions that could easily substantiate a separate park each unto themselves. Established as the first national park in 1872, Yellowstone acts not only as a showcase for the park system but also as a beacon for other parks to look toward for planning decisions. The popularity of the park has brought with it a large number of vehicles and, especially at peak times, negative externalities, including: traffic congestion, pollution, and loss of wildlife due to vehicular collisions.

The deployment of clean bus technologies to develop a transit or tour district in Yellowstone and its surrounding areas would promote environmental sustainability, gateway community economic development, and an enhanced visitor experience.

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## 0. Preface

This research has been conducted under the National Park Transportation Scholars program. The program is made possible by a grant from the National Park Foundation, which is funded, in part, by the Ford Motor Company.

Transportation Scholars are placed in National Parks that have requested assistance on transportation related projects, with the goal of:

... supporting and promoting sustainable transportation solutions that help preserve park resources and, at the same time, enhancing the visitor experience (National Park Foundation, 2004).

John Sacklin, Chief of Planning and Compliance at Yellowstone National Park, specifically requested a scholar to examine the feasibility of a clean tour district.

A tour and energy district would help protect park resources by reducing congestion on park and regional roads, and by encouraging the use of alternative, less polluting fuels, reducing air pollution and local and regional haze in the area. Loss of wildlife due to collisions with vehicles, which is a significant issue in the parks, would be reduced by providing an inviting alternative to private automobiles (Sacklin, 2002).

Thus, this report is the output of the feasibility study. To learn more about the National Parks Transportation Scholars Program, please visit:

[http://www.nationalparks.org/proudpartners/partner\\_ford\\_sch.shtml](http://www.nationalparks.org/proudpartners/partner_ford_sch.shtml)

## **1. Introduction — Clean Tour District Feasibility**

A growing number of organizations representing interests in local gateway communities in the Greater Yellowstone Area (GYA) are examining mass transit as way in which to promote alternative fuel use, environmental sustainability, and economic vitality. A small sample of these organizations includes:

- National Park Service
- Clean Cities Coalition
- Yellowstone Business Partnership
- Southern Teton Area Rapid Transit (START)
- Idaho National Engineering and Environmental Laboratory (INEEL)
- Western Transportation Institute (WTI)

Specifically for Yellowstone, several studies have been conducted over the past decade to examine alternative transportation modes. Some of these include the Alternative Transportation Modes Feasibility Study in 1994, Transportation Study—Dunraven Road in 1997, and research conducted by the Western Transportation Institute on visitor information display in alternative vehicles in 2002.

The motivation for writing this report is to capture the momentum created by the park and these communities by examining the feasibility of a clean transit or tour district in Yellowstone. The goals of such a district must echo the larger goals of the park — that any new development must enhance visitor experience and maintain or improve the park's natural resources. This concept is also described as a tour district because visitors come to Yellowstone and the Greater Yellowstone area to tour, not necessarily to ride transit. This report is an overview intended to provide an initial review of such a district's feasibility. The steps to initiate and ultimately implement a district are outside the scope of this report as such a task would require additional analysis and planning.

## 2. Yellowstone — A Park of Paradoxes

Beautiful. Serene. Open. Ask any visitor to describe Yellowstone, and words like these will follow. Sadly, the simple magnificence of the park may also be described as: frustrating, congested, and chaotic. Yellowstone is a park of paradoxes; with nearly 3 million annual visitors, any visitor may experience a widely different park. For example, Photo 1 below was taken at the north entrance during the peak summer season.



**Photo 1: Congestion at the North Entrance to Yellowstone**

By comparison, Photo 2, along the Beaver Ponds trail, was taken at roughly the same time, just a few miles from the north entrance and just over a mile past the trailhead.

A visitor or recreating employee could easily experience both of these scenarios within one hour. Choices made by visitors drastically impact their experience in the park.





**Photo 2: Small Pond along Beaver Ponds Trail**

Yellowstone boasts over 2.2 million acres of open space, and to capture the solitude shown in Photo 2, one need only be willing to walk a few hundred yards on many trails. Research shows, that for most visitors, this is not the case:

Only 7% of visitors hike off the main roadways into the park backcountry (National Park Service — Alternative Transportation Modes Feasibility Study, 1994).

The stark contrast between Photo 1 and Photo 2 illustrates one of the many paradoxes of Yellowstone — that the crowded park is at the same time empty. Likewise, surveys show that as many as 84% of visitors see Old Faithful (National Park Service — Visitor Services Project Report 25, 1990). For some, Yellowstone *is* Old Faithful, but there are nearly a dozen other major attractions, each of which, in isolation, would justify a national park unto themselves. For example, a mid-summer visitor of the Lamar Valley may have a vastly different experience than another joining the crowds at Old Faithful. These paradoxes of location, the visitor's choice of where to experience the park, are also found in seasonality and mode of transit.

Between 1990 and 1992, only 3% of the visitors arrived between January and April. Visitors choosing to visit the park during its peak in mid-July versus during a shoulder-season visit in mid-April would encounter 29 times more vehicles on the park roads (National Park Service — Visitor Services Project Report 25, 1990). Again, visitor choice, in this case which season to plan a visit, sculpts each visitor's experience.

Visitors may feel that the automobile is or has been integral to their visit to Yellowstone, but this perception is quite new and accounts for less than one-half of the history of the park. Personal automobiles were initially permitted in the park in 1917, but the biggest thrust came in 1946 after World War II. Anyone having visited the park in the last 60 years would undoubtedly describe their visit in relation to the automobile they traveled in. Yellowstone is an *automobile park*, or a park which effectively necessitates an automobile to visit, and for the near future, this will continue. This was not always the case. Chronologically, mass transit has dominated Yellowstone's travel history. The first visitors, after the park's inception in 1872, came on the railroad and were greeted at the rail station by informal tour guides — any person who was willing and owned a horse and buggy. From this time until the end of the Second World War, rail access reached several entrances of the park, and stage coaches were replaced with buses (Whittlesey, 2003). Thus, previous to the 60 years of mainly automobile travel, 70 years of mass transit dominated the park's history. Photo 3, the classic tour bus, was taken in the summer of 2003, but, as an artifact, it could have been taken in many of the previous decades. Nevertheless, there is currently a pro-automobile sentiment that prevails in and around the park. This is seen in the way in which visitors choose to experience the park — roughly 1% of visitors ride tour buses or snow coaches, while the other 99% use private vehicles (Kelly, 2003). This sentiment may infer a reluctance to see private vehicles, especially automobiles, as problematic.

Many visitors feel that automobiles do *work* in the park, and this perspective may act as a barrier to adopting mass transit. Other factors that challenge mass transit adoption and latently promote automobile travel include Yellowstone's over 300 miles of roads, a maximum speed limit of 45mph, and the likelihood of a visitor wanting the flexibility to enter and exit via different

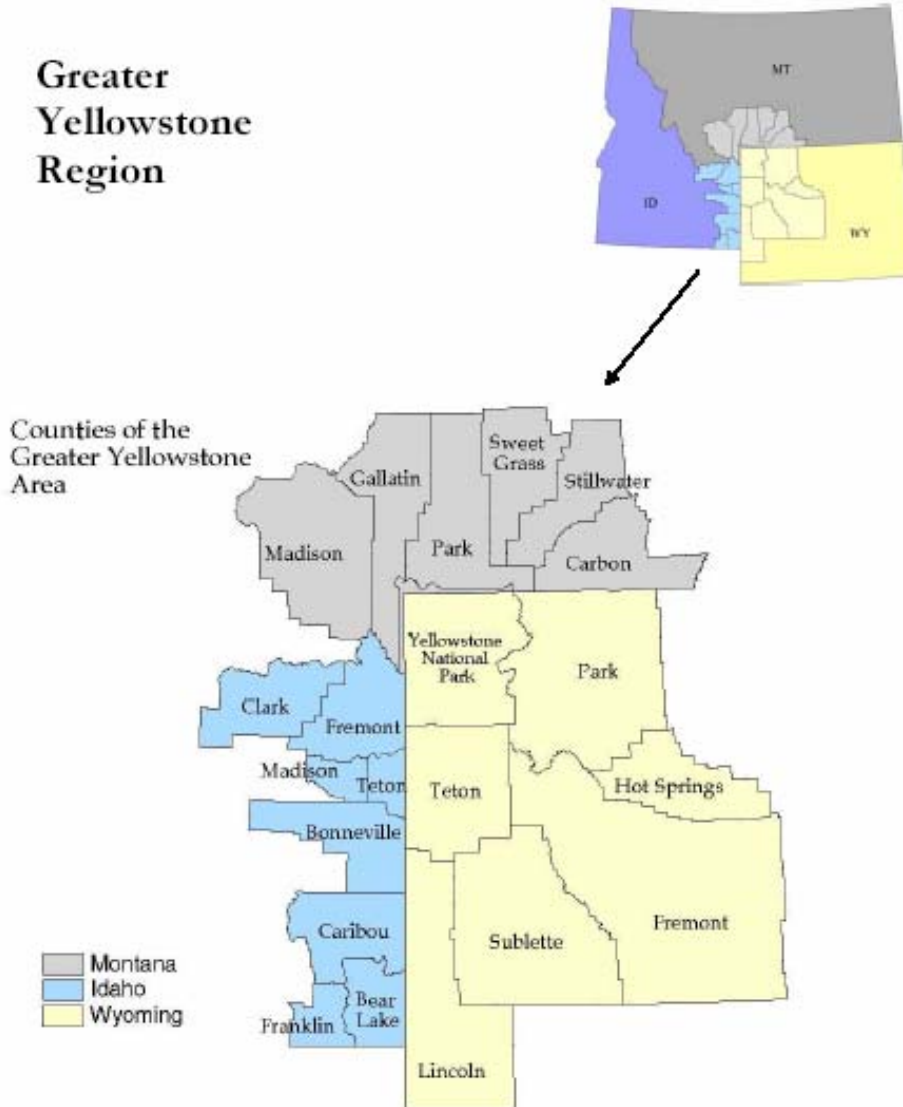
entranceways (to include another destination in their trip, such as visiting another National Park or local friend/relative).



**Photo 3: Old Yellow Bus in Mammoth Hot Springs**

Yellowstone is isolated. The combination of its location in the open west and having Federal management jurisdiction suggests an independent secluded land-locked island. This is not entirely true. The park's five entrances and exits lead to five neighboring gateway communities. If the definition of *gateway communities* can be extended to include any community whose residents are impacted by the park, be it commercially, recreationally, or even simply experiencing through-traffic, the number jumps from five to at least twenty (Sonoran Institute, 2003). Janice Brown, Executive Director of the Yellowstone Business Partnership, claims that this number is closer to 25.

The 25 counties that comprise the Yellowstone-Teton region have a combined population of 650,000, and one of the goals of the Yellowstone Business Partnership, as regional stewards, is to think more broadly about this landscape — that one could think of this region as a very large metropolitan area with two large central parks (Brown, 2004).



**Figure 1: Greater Yellowstone Region**

Just as a migrating bison does not recognize a separation between the park boundary and the neighboring community, nor does a visitor feel a distinct separation as they enter or exit the park. The Journal of American Planning supports this thought:

...gateway communities should be viewed not as threats to the parks but as an integral part of the park experience (Culbertson, 1997).

This is further emphasized in growth. Yellowstone has had fairly flat visitation — roughly 3 million visitors per year over the past 10 years. On the other hand, the gateway communities are experiencing rocketing population growth.

Currently more than 370,000 people live in Greater Yellowstone. From 1970 to 2000 the area's population grew by 141,621 people, a 61% increase (compared to 38% nationally) (Sonoran Institute, 2003).

Thus, the park with flat visitation, which is somewhat managed in isolation, sits as the nucleus of a region where population is exploding and where the region itself is expanding geographically. A side-note to highlight this expansion is a new service being offered by Teton Stage Lines. The service shuttles passengers the 300 miles from the Salt Lake City airport to West Yellowstone, Montana. Salt Lake City may not be considered part of Greater Yellowstone, but it is clearly receiving Yellowstone tourist and resident traffic.

All of these paradoxes define Yellowstone: crowded and empty, congested and open, mass transit and automobile, isolated park and integrated gateway community. These paradoxes are crucial in defining the perspective in which we examine the feasibility of a clean tour district. The tour district must address fluctuating demands due to season or location. It must examine visitor's attachment to their cars while simultaneously accounting for Yellowstone's history of mass transit. Further, the district must integrate the gateway communities as interlaced conduits in which visitors enjoy the park. By maintaining this view, we may more fairly evaluate a clean tour district's role in Yellowstone, even if some of the facets appear to be somewhat contradictory.

### 3. Perceptions of Transit/Literature Review

#### *Clean Bus Tour District*

By studying other examples of public transit, we gain insight into what may or may not work in Yellowstone. Previously, this paper mentioned a clean bus tour district; this may sound as if many of the choices had been made before the feasibility study, and some clarification is necessary. The word *clean* in clean bus transit district refers to emissions. Yellowstone complies with the Clean Air Act and has further been proactive on the issue of air quality through participation in organizations such as the Clean Cities Coalition and use of alternative fuels like biodiesel and ethanol. Thus, the clean bus transit district would undoubtedly capitalize on clean fuel infrastructure and advanced technologies to improve emissions in and around the park. The second clarification refers to choosing buses over other mass transit options such as light rail or elevated monorail.

#### *Why not light rail or elevated monorail?*

Much controversy has occurred over the proposed use of light rail and elevated monorail in Yellowstone. From former Wyoming Senator Malcolm Wallop to local community members today, park visitors are attached to the idea of light rail and monorail.

...Senator Malcolm Wallop, of Wyoming, proposed that all of the roads within Yellowstone National Park be replaced with a monorail system to keep the crowds in check. He argued that the park service could take some lessons in crowd management from the Disney Company (Culbertson, 1997).

As recently as 2003, results from a focus group supported Senator Wallop's opinion — that transportation in Yellowstone should be managed similarly to a theme park:

Some people thought that Yellowstone should set up a system similar to those currently used in some parks and zoos, and put in a monorail or train type system that you could ride through the park, making scheduled stops. One focus group participant said it would be nice if they could put a train through the park that would not follow the roads but go to places you do not get to see from the roads (Kelly, 2003).

In response to visitors' affinity for light/monorail, the 1994 Alternative Transportation Modes Feasibility Study (ATMFS), included both as mass transit options for various portions of the park. As stated in the ATMFS, light rail and elevated monorail are 10 to 30 times the initial investment of conventional shuttle buses, would necessitate the installation of electric power along the route, and require a road for maintenance and emergency vehicle access (National Park Service — Alternative Transportation Modes Feasibility Study, 1994). This combination creates quite a large and expensive ecological footprint. Further, light rail and elevated mono-rail would not allow nimble changes to routes due to demand, inclement weather, or emergencies that a conventional shuttle would offer, as well as the inability to drop passengers off anywhere, such as a backcountry trailhead. Areas for elevated monorail are also limited due to their need for deep-seated support structures. These structures are completely incompatible with the abundant thermal features of the park.

On the other hand, buses offer both unlimited service area and stop/station location. Bus districts offer greater price control to transportation planners, as they are not limited to the few specialized vendors of light/monorail equipment and infrastructure. For these reasons, if mass transit proves feasible, a clean bus transit district is the clear direction for Yellowstone.

### *Challenges of Mass Transit*

In the following literature review of attitudes towards mass transit, seven main themes resounded:

- uncertainty of bus arrival/departure time,
- frequency,

- financial incentive,
- time spent on mass transit versus personal vehicle,
- rider experience,
- environmental considerations, and
- information/marketing.

If a clean bus transit district is to be successful in Yellowstone, these concerns must be addressed. Fortunately, most of these issues have also been explored in the literature, offering the opportunity to glean lessons from other transit districts.

### Uncertainty

Ken Turner, a senior manager at Portland's Tri-County Metropolitan Transit District (Tri-Met), was researching enhancements to Portland's bus system and found that one of the biggest reasons for rider dissatisfaction was the chronic lateness of the buses.

...“uncertainty was a huge barrier to taking the bus.” Reducing uncertainty, he felt, could be a powerful tool for improved customer satisfaction, and perhaps increased levels of ridership...(Krouk, 2002).

Tri-Met has since combated this issue by installing global positioning systems (GPS) on their buses, as well as real-time arrival information at bus stops. The *countdown* at bus stops proved hugely successful in improving rider satisfaction, even though the buses continued to be late.

In a complementary study on the tourism impacts of intelligent transportation systems (ITS), researchers at Acadia National Park found overwhelmingly positive results from electronic bus departure signs.





**Photo 4: Countdown at Bus Stop in the United Kingdom**

As evidenced by the very high percentages of “strongly agree” and “agree”, managers believe that the electronic bus departure signs and the automatic next-stop announcements will help tourists:

- get around more easily (95%)
- increase the likelihood of using the Island Explorer bus (93%)
- relieve uncertainty about when the bus will arrive at the bus stop (90%)
- improve the travel experience overall (90%)
- relieve uncertainty about when to exit the bus (85%)
- utilize their time, such as visiting shops before a bus arrives (87%) (Zimmerman, 2003)

These two examples illustrate that riders do not mind buses being late as much as not knowing when, exactly, the bus will arrive. Frustrated riders that would normally be fidgeting and looking at their watches can spend the extra time in a coffee shop, spending dollars at a local merchant, or simply doing something else, knowing an accurate arrival time for their bus.

## Frequency

Even those inclined toward mass transit for environmental or other reasons often feel they are not really given the true choice of public transit over their personal vehicles, since their local service times are simply not frequent enough and thus, an unrealistic option. The Thoreau Institute captures this general disdain for infrequent service eloquently:

For those whose goal is to increase transit usage and reduce auto driving, the single most effective policy is to increase the frequency of existing transit services (Thoreau Institute, 1997).

If frequency is the obvious key to ridership, what is the sweet spot to induce riders out of their vehicles and onto mass transit? Surely frequencies and bus schedule timetables must capitalize on adaptive management and respond to demand, but is there a simple line in the sand on where to start? Most research points to the 30-minute mark. At 30-minutes, ridership increases dramatically and gives the impression of a true mass transit service.

Certain minimum density levels have been identified as required in order to support basic levels of transit service, for example, a bus with a 30-minute headway (Gilbert, 2002).

...the time frequency will be 30 minutes rather than one hour. The Review Team believes that is important to go to 30 minute service rather than one hour because at one hour transit is not attractive to any type of rider (Regina Transit, 2002).

Other time theories abound on when to begin or end service and how to manage peak times. Ideally, for transit, the best schedule is no schedule; buses should operate so frequently that riders don't need to look at schedules. This is the case in Zion National Park (discussed later), where the shuttle operates every 6 minutes during peak hours. For Yellowstone, such frequency is infeasible, at least initially, due to long distances between attractions. For an upper threshold, the 30-minute headway is the baseline that transit officials agree upon. It serves as an excellent starting point for any nascent transit service.

## Financial Incentive

The Marketing Institute at Florida State University conducted a survey on what would encourage commuters to use alternative transportation. The number one response, with nearly 60% of the respondents concurring, was a financial incentive (Marketing Institute, 2003). In a sense, this financial incentive could be considered a form of payment, in that it refers to a reduction in the cost of driving.

In 2003, AAA estimated the cost of driving an average vehicle at 51.7 cents per mile (AAA, 2003). Interestingly, a local transit district, Southern Teton Area Rapid Transit (START), has taken these numbers and applied them as a benchmark for their new commuter service from Alpine, Wyoming to Jackson, Wyoming. By using the AAA number multiplied by the 40 mile commute distance between Alpine and Jackson, the roundtrip commute cost is over \$800 a month. START is attracting riders by offering monthly passes for \$100. Michael Wackerly, from START, suggests that even if you subtract the purchase of the vehicle, registration, insurance, and depreciation, it is still cheaper to take their bus, based solely on operating costs. AAA estimates simple operating costs (gas, maintenance, and tires) at 13.5 cents per mile (AAA, 2003). The roundtrip from Alpine to Jackson, by car, would still cost over \$200 a month, based purely on operational costs. START feels that this financial incentive will be enough to get a critical number of automobiles off the road to reduce congestion.

One might speculate that a financial incentive may not be as important to tourists traveling in and around Yellowstone. Yet tourists feel similarly, and this is discussed further in chapter 5. Also, in addition to the large financial incentive, Wackerly is convinced that, for many riders, the bus will offer a non-monetary benefit of improving the riders' quality of life. He felt that the rider experience will be much more relaxing than driving (Wackerly, 2003). Wackerly's thoughts are supported later in this chapter regarding rider experience.

Further supporting a financial incentive, the Mineta Institute at San Jose State University, CA, conducted a survey of public transit riders in metropolitan areas across the U.S. They found a strong inverse correlation between a decrease in transit fares and an increase in ridership:

The 11 percent decrease in inflation-adjusted transit fares since 1996 is closely correlated with a 12 percent increase in total ridership and a 10 percent increase in transit trips per capita over the same period (Taylor, 2002).

Clearly there is a relationship between cost of mass transit and adoption or ridership. It may be that the difficult task lies not only in finding subsidies to lower the costs of public transit, but also in educating the public to the true cost of driving their cars. The net result is that there must be a combination of low fares and consumer education to teach the public the lifestyle and cost benefits of public transit.

Time: It takes too long

The San Francisco Metropolitan Planning Commission held community workshops to garner input on their 2001 Regional Transportation Plan. One of the key takeaway messages from the workshops was that 62% of the respondents didn't utilize public transit simply because it took too long (Metropolitan Transportation Commission, 2001).

If the bus is subject to traffic congestion due to sharing the roadway with other passenger vehicles, making time improvements will be difficult. This is especially true in Yellowstone. The two-lane winding roads allow minimal passing, and drivers are limited to traveling only as fast as the car in front of them. Therefore, the only way to increase speed is by reducing the time at passenger stops. The two most effective ways to do this are to streamline fare collection and to engineer buses with low floors and bus stops, or platforms, with raised floors. The Federal Transit Authority (FTA) supports both of these initiatives in their best practices document on developing effective Bus Rapid Transit (BRT) systems:

This includes passenger boarding time, collection of fares, etc. Boarding time can be reduced by improvement of the fare collection process, e.g. pre-payment of fares, self-service fare collection (honor system), greater use of passes, smart cards, etc. and by easing the boarding process with low floor buses together with high platforms so that wheelchair-bound passengers could roll on without lifts (Federal Transit Authority — Issues in Bus Rapid Transit, 2003).

In addition to time savings with wheelchair boardings, the low floors also expedite elderly boardings and parents/childcare-givers with strollers.



**Photo 5: Low Floor and Wheelchair Access on New Yellow Bus**

David B. McBrayer, from Parsons Brinckerhoff, seconds the FTA suggestions in his paper on Transit Technology:

Advantages of the low-floor vehicles include easier satisfaction of ADA [Americans with Disabilities Act] requirements, and greater speed and convenience of passenger entry and exit from low station platforms...(McBrayer, 2002).

New technologies, combined with common-sensical systems for embarking and fare-collection can substantially help bus transit compete with the nimbleness of the personal automobile.

## Rider Experience

Boston residents, once skeptical of a new late night bus service, have since touted its success. The added service, implemented by the Massachusetts Bay Transportation Authority (MBTA), has been named the Night Owl Bus, the bus service that specifically serves Boston's bar scene between 1 and 2:30am on weekend nights.

The Night Owl has turned into such a party scene that the Boston Globe describes it as "a rolling nightclub." "I think it's gonna be a major hook-up scene," said one tipsy rider on the inaugural weekend. "All it needs is a disco ball." About 6,000 people are riding the Night Owl, twice what transit officials had expected (Civic Strategies — Metro Area Scan, 2001).

While quoting an inebriated transit rider may seem unorthodox, this rider is hitting on an excellent point: one of the main reasons for riding the Night Owl is not just convenience, but atmosphere. Riders on the Night Owl are not simply getting out of their cars and onto the bus but out of their cars and into an experience. The MBTA has succeeded in adding a new coat of paint to bus riding by breaking the old paradigm of a slow old dirty bus to an enjoyable and exciting way to get around town.

In Los Angeles, teachers and volunteers are trying to teach local adolescents about public transit and show them that it can be fun. Volunteers take students, via public transit, to local attractions like the aquarium to expose students to the world outside their neighborhoods. The results have been very positive:

First-time public transit user Christopher and 39 other Rowan Avenue Elementary School students said the journey was far more fun than the usual school bus ride, especially the elevated portions of the rail line.

"When you get high above everything else, it's like you can see the whole world,"... (United Transportation Union, 2002).

Local parents are following the lead. They see it as an opportunity both to educate their children and as an innovative way to spend quality time:

"My kids had never been on a bus before, and we were all a little skeptical," Del Real said. "This proved, 'Hey, we can do this,' plus it gave me a great opportunity to talk to my kids. We shared things we never can talk about when I'm driving because I'm too distracted." (United Transportation Union, 2002).

Here again, the positive aspects of public transit are just under the surface, especially when hidden attributes like excellent views and no parking hassles are discovered.

### Environmental Considerations

Environics Research Group has found that many consumers are frustrated with congestion levels, especially in metropolitan areas. Furthermore, consumers are reacting to increasing pollution and feel that direct action must be taken to mitigate environmental degradation. Through surveys, Environics found that most citizens felt that the answer to both of these problems lies in ramping up usage and infrastructure of mass transit:

The surveys finds widespread support for the idea of encouraging people to switch from their cars to alternate forms of transportation. More than eight in ten residents say it is very (48%) or somewhat (35%) important that people drive their vehicles less often and use other types of transportation like buses, bikes or trains more often.

Those who think it is important that people change to alternate forms of transportation are motivated primarily by concerns over pollution (78%) and traffic congestion (55%).

...to help combat air pollution. About three-quarters are likely to take alternative methods of transportation, such as public transit or carpooling, to work (50% very likely, 23% somewhat likely)... (Environics Research Group, 2002).

These respondents are clearly aware of problems associated with growing automobility. Envionics' research suggests that consumers are ripe for new clean mass transportation solutions.

### Information/Marketing

The perception that only those who either cannot drive or cannot afford to are the sole market for mass transit is simply not true. What is lacking is not only the proliferation of mass transit but also information access. Potential riders in any transit system must first be aware of the system and then be taught where it goes and how to use it. The U.S. Department of Transportation recognizes this need for mass transit marketing:

The success of market-oriented approaches to public transit is heavily dependent upon marketing and information availability (U. S. Department of Transportation, 1991).

Thus, the key to a superior transportation system is to support that system with marketing efforts to teach the public how to use it, that it is less polluting, and that it provides a more enjoyable travel experience.

### Conclusion

In examining current trends in mass transit, and more specifically, bus transit, these examples have offered excellent ideas and recommendations that can easily be applied to a clean bus transit district in Yellowstone.



With the public's acceptance level reaching a critical mass, this is an excellent time to evaluate mass transit as an alternative to personal vehicles.

Rail and Bus Systems are in a Building Boom: More regions are developing mass transit and more consumers are choosing mass transit over driving on congested roadways (Reconnecting America, 2003).

In summary, the literature review has shown us that building acceptance and adoption must occur through first building an excellent transit system and then combining it with user information and marketing. More specifically, if we are to build a clean energy bus district in Yellowstone, it must:

- give real-time arrival information at every station,
- offer scheduled headways, or time in-between buses, not greater than 30-minutes,
- clearly illustrate the cost of driving and establish fares that are clearly cost effective over driving,
- utilize low floors, collect fares efficiently, and capitalize on other common-sensical trends to minimize passenger stop times,
- give riders an experience they would not otherwise have in their cars (for example: better views, access to restricted areas, a time to enjoy each other, or information about their surroundings),
- use environmentally friendly fuels to lessen pollution, and
- use these platforms to market and communicate with the public.

These suggestions are hardly the universe of everything necessary to build a successful clean energy bus transit district, but they do act as a baseline of components which would help facilitate adoption in the park. The next step is to examine how other parks have tackled mass transit and what we can learn from them.

## 4. Case Studies — Bus Districts in Other National Parks

### *Zion National Park*

Zion National Park is located in the southwest corner of Utah, next to the city of Springdale. Although the park covers almost 150,000 acres of canyons, sandstone cliffs, and deep valleys, the majority of visitors stick to the Zion Canyon Scenic drive (U.S. Department of Transportation Volpe National Transportation Systems Center, 2003). Zion is only 1/10<sup>th</sup> the size of Yellowstone, and yet, it has nearly the same visitation.

**Table 1: Zion Visitation Statistics & Shuttle Service Description**

Visitation statistics:		
	Recreational Visits <sup>1</sup>	2,592,545
	Total Visits (including employees, contractors, etc.) <sup>2</sup>	2,614,445
Shuttle service:		
	Vendor:	Parks Transportation Inc.
	Inception Date:	2000
	Operation:	April – October
	Bus Manufacturer:	ElDorado National
	Fleet Size:	30 buses and 21 trailers
	Fuel:	Propane
	Funding:	\$10 of \$20 entry fee goes toward transportation
1 & 2. National Park Service — STATS, 2003		

Zion began a shuttle service in 2000. Previous to the shuttle service, Zion experienced congestion, air and noise pollution, wildlife incidents, and parking problems. Parking during the

peak season was far and away the most noticeable problem and the one that most irritated visitors. Kirk Scott, from Parks Transportation Inc., claims that parking problems were the key to the success of the shuttle:

Generally shuttle systems work best and are most attractive to visitors when there is a significant

shortage of parking relative to the need for it. They can greatly expand the number of people who can access a particular trailhead or other park attraction. At Zion, the shuttle system expanded the park's capacity to handle visitors on heavy use days by more than five times its capacity when there was no shuttle system. The shuttle system, with stops adjacent to most major park attractions, is far more convenient for most visitors than if they had to depend on their car to access those same attractions (Scott, 2003).



**Figure 2: Zion Shuttle Map**

The route of the shuttle is fairly simple — it begins at the southern end of Springdale and stops at the entrance to the park. There, passengers disembark, cross a bridge, pay the park entrance fee, and board another identical bus. Visitors may also drive to the entrance of the park and leave their vehicles there — basically a park and ride system. The shuttle operates from April to October, and during this period, no other vehicles are allowed on Zion Canyon Scenic Drive. A few exceptions include administrative vehicles, climbers (who are allowed to drive in and drop off their climbing equipment), and Zion Lodge guests (who are given a pass which allows them to

drive up to and park at the lodge).

Over the past four years, usage of the shuttle has grown, and now the project is considered hugely successful. One of the main reasons for the shuttle's success is simply because it is

mandatory. Other components which have aided its success include usage by locals, business and local word of mouth marketing, and the geographic shape of the canyon.

The shuttle is free, both in town and in the park (although park visitors pay indirectly, as half of the \$20 park entrance fee funds transportation related expenses). This fareless system not only expedites boarding, by allowing riders to enter through either the front or rear door of the bus, it has also given locals an incentive to ride the bus for trips when they might have otherwise driven. Bob Jones, who also works for Parks Transportation Inc., commented that many of the local residents work two jobs — one in the park and one in town. Since the shuttle operates as often as every 6 minutes during peak hours, locals have found it faster and more convenient to use the shuttle versus driving and parking. Local families greatly benefit from the shuttle, since many are able to live in the gateway community and forego the expense of an additional vehicle needed for in-town commuting (Jones, 2003).

Word of mouth marketing has also played into the success of the shuttle. When visitors encounter locals on the street and ask them for directions, locals naturally direct them toward the shuttle, since many of the locals are super-users themselves. The National Park Service has also developed a program called “Ambassador’s Training” which they hope to implement in the future. The program would teach local businesses about the park and the transportation system; in exchange, local businesses would be allowed to post a shield in their storefront windows which indicates to visitors that they can answer questions and provide information (U.S. Department of Transportation Volpe National Transportation Systems Center, 2003). Clearly, the community of Springdale and Zion National Park have both worked hard to integrate the service into the community, and it has paid off.

After hearing the accolades of Zion’s shuttle, it might appear that a shuttle service is an ideal transportation solution for every National Park and gateway community. Obviously this may not be the case, and one of the biggest reasons for Zion’s shuttle’s success (in addition to the shuttle being mandatory 6 months of the year) is the geography of the system.



**Photo 6: Shuttle in Zion National Park**

The length of Zion Canyon Scenic drive is only 7 miles, and the in-town portion of the shuttle is less than 3 miles. As discussed previously, these short distances allow very frequent service which greatly increases ridership. The canyon geography effectively mandates one way in and out. Thus, in Zion, there is no need for a complex web of different routes, transfers, and connections. Riders can feel confident that, after getting off the bus and taking a hike up the Narrows, a bus will arrive shortly to return them to their cars or downtown Springdale.

After installation of the shuttle, a group of employees from Zion and other National Parks, Denver Service Center, and local business owners conducted a fact finding session. These highlights from their trip provide an excellent summary to the benefits and challenges of building a bus transit district in Zion:

- It is more cost effective for the park to own the buses and physical components of the system (including the maintenance yard) and hire a vendor to manage the service. Current cost is \$43.22/hr. Parks Transportation Inc. has a sister company, Rocky Mountain Transit, that offers a similar service in Rocky Mountain National Park. Rocky

Mountain Transit owns all of the assets, and the cost to the park is 2-3 times what Zion pays.

- The trailers greatly increase capacity without the capital expense of additional buses and drivers.
- The design team from Denver Service Center flew out once a month. It would have been preferable to have the designers onsite. The park employees also felt that the distance diminished their ability to offer input.
- Visitors must be shown that there is a *need* for the shuttle before they will embrace it and be willing to deal with added trips and the perceived inconvenience.
- The shuttle has improved local business, although in an unexpected way: lunch business has slowed (people are staying in the park longer), and dinner business has increased. Restaurants and retailers have shifted their hours accordingly. Nearly every business is asking for a transit stop.
- Average stay has increased from 1.3 days to 2.0.
- Existing meeting places, like restaurants and lodges, are natural bus stops, especially since they already have parking that business owners were willing to offer for free, due to increased traffic at their establishments. Separate staging areas are inconvenient, expensive, and less effective.
- Standard buses seem better than prototypes. Training, operation, and maintenance (especially finding parts) are all easier. Pricing is more negotiable and resale of the assets is easier.
- Zion's initial capital investment of 30 buses catalyzed the district development that would've otherwise stagnated. Zion found the initial dollars to be the toughest — operational dollars were easier, especially since the service was well thought out and successful. This does defy conventional thought in the Park Service, where it is often easier to find the initial funding, but the ongoing maintenance costs prove more challenging (Zion National Park, 2003).

### *Acadia National Park*

Acadia National Park lies on the central coast of Maine and is similar to Yellowstone, in that it has many entrances and exits. Len Bobinchock, Deputy Superintendent, aptly describes the park:

Acadia National Park is a 'porous park' – lots of traffic going in and out, since the park was 'imposed' on several communities (Joint Ventures — Partners in Stewardship, 2003).



**Photo 7: Island Explorer in Acadia**

Further, since many of the parking lots serve multiple purposes, such as an overlook or trailhead, Acadia suffered from substantial parking and traffic congestion. This congestion prompted the proposal of what is now the Island Explorer bus system.

**Table 2: Acadia Visitation Statistics & Shuttle Service Description**

Visitation statistics:		
	Recreational Visits <sup>1</sup>	2,558,571
	Total Visits (including employees, contractors, etc.) <sup>2</sup>	2,811,147
Shuttle service:		
	Vendor:	Downeast Transportation, Inc.
	Inception Date:	1999
	Operation:	Year-round
	Bus Manufacturer:	Blue Bird TranShuttle
	Fleet Size:	17 buses
	Fuel:	Propane

	Funding:	Park entrance fees, Federal Highway Administration, Federal Transit Administration, Maine Department of Transportation, local resident taxes, and a donation from L.L. Bean
1 & 2. National Park Service — STATS, 2003		

The gateway communities are the pearls of the Island Explorer. The Mount Desert Island League of Towns represents the six towns surrounding the park. The League of Towns gave local residents and business owners a unified voice. From the initial planning stages, Acadia held charrettes with local residents and began discussions for funding and operations with the Maine Department of Transportation, Federal Highway Administration, and the Federal Transit Administration. The local communities also contribute tax dollars to the transit system, and the remaining funds come from park entrance fees.

Acadia had somewhat of a dynamic bus acquiring process. The State of Maine purchased the first 8 buses, and the second set of 9 buses (for a total of 17) was purchased using Federal Lands Highway funds. All of the buses have been turned over to the State of Maine for one consistent fleet of vehicles. Any additional dollars that are needed or acquired will now simply be handed over to the State of Maine, so that they may purchase the vehicles directly. The State of Maine has a contractor that operates the system, Downeast Transportation, Inc., and they operate the system under contract with the State and a cooperative agreement with the park. Much like Zion, the bus district is successful because a large number of locals use the bus to both recreate and commute.

In 2002, 21% of survey respondents were year-round or summer residents (Tom Crikelair Associates, 2002).





**Photo 8: Island Explorer Bus**

Bobinchock also feels that the bus system has become a valuable tool for employers that need to get their employees to work, especially at restaurants where parking is a premium commodity. Restaurateurs and retailers within close proximity to a transit stop have found better access to the labor pool than those without (Bobinchock, 2003). This sentiment is also found elsewhere within the Park Service and its ability to maintain talent:

Park managers at Everglades National Park and Shenandoah National Park suspect that transit could provide a solution for attracting and retaining employees where lengthy commutes to remote locations diminish the appeal of part-time or low-paying jobs (Cambridge Systematics, 2001).

Although, like Yellowstone, Acadia has multiple entrances and exits, the park itself has distinct advantages that have aided adoption of the transit district. Founded in the early 1900s, Acadia's geography is comprised predominantly of 47,532 acres of woodlands against the shoreline (National Park Service, 2003). Acadia's small size, less than 1/3 the size of Zion and over 40 times smaller than Yellowstone, means short distances between attractions. The attractions also have very small parking lots which quickly reach capacity in the summer. The lots are so small that recreational vehicles (RVs) in the park are basically non-existent (Bobinchock, 2003). The result is a captive market riding a bus system short distances. Any irritation with the system is likely washed away with the tide as the visitors riding the bus can look at gorgeous beachscapes versus the road just above their steering wheels.

The Island Explorer covers travel in the park and, in the summertime, the nearby airport at Bar Harbor. This may be only a short portion of a visitor's entire trip, and the park recognizes this. The park worked with Downeast Transportation, Inc. to create a website — *Getting to Acadia: Car-Free Travel Guide*. The guide interactively shows prospective visitors: *Eight ways to arrive in Bar Harbor without a car*. Currently, most visitors continue to drive to the park, but this information portal is an excellent step towards giving consumers the marketing and information availability that the U.S. Department of Transportation touts as the key to a successful transit system.

Acadia, like Zion, offers a few excellent best practices which are applicable to any transit district:

- Early involvement with the State, Department of Transportation, Federal Highway Administration, and other players is crucial.
- Community members wear many hats. They are visitors, entrepreneurs, commuters, and marketers for any transit district. Tailoring the system to meet their needs first and foremost will likely lead to a successful system for visitors as well.
- If visitors are *feeling the pain* of congestion, they will be quicker to embrace a new system.
- Short distances between attractions make the bus service more tolerable, especially when compared directly to the flexibility of a personal vehicle.

### *Yosemite National Park*

By means of comparison, if Acadia shares more similarities with Yellowstone than Zion, Yosemite is closer yet. At 761,266 acres, it is still only 1/3<sup>rd</sup> the size of Yellowstone, but in contrast, it is over 4 times the size of Zion and 15 times the size of Acadia (National Park Service, 2003). Given its size, visitation, climate, and mountainous geography, Yosemite is probably the park that is the most comparable to Yellowstone in the entire National Park System.



**Photo 9: Congestion in Route to Yosemite Valley**

**Table 3: Yosemite Visitation Statistics & Shuttle Service Description**

Visitation statistics:			
	Recreational Visits <sup>1</sup>		3,305,631
	Total Visits (including employees, contractors, etc.) <sup>2</sup>		3,468,174
Bus/Shuttle service:			
		<i>Yosemite Valley Visitor Shuttle (YVVS)</i>	<i>Yosemite Area Regional Transit System (YARTS)</i>
	Vendor:	Delaware North	Via Adventures
	Inception date:	~1971	2000
	Operation:	Year-round	Year-round
	Bus manufacturer:	Gillig	Van Hool
	Fleet:	12 (10 operating during peak service)	6 ‘runs’, more expected, buses owned by Via Adventures along with their larger fleet

	Fuel:	Diesel, to be replaced by alternative fuel buses in 2004	Diesel, evaluating CNG
	Funding:	Add-on to visitor rates (lodging, etc.)	Fare box, county taxes, CalTrans, Federal Transit Authority, Advanced Technology Program
1 & 2. National Park Service — STATS, 2003			

Yosemite, like Yellowstone, has long distances between attractions, mountainous terrain, with large variances between the valley floor and nearby peaks, and also experiences the *windshield tour* phenomenon, or visitors entering one entrance to the park and exiting another. Many visitors experience the park behind the wheel of an automobile in Yosemite Valley or on Tioga Pass in route to another destination, like Las Vegas. Yosemite is often jokingly referred to as “California’s favorite RV parking lot” (Andersen, 2003). The Farley comic, in Figure 3, incisively depicts both the Park Service’s challenge and visitor’s reticence to use mass transit:



Figure 3: Farley Cartoon by Phil Frank

Yosemite offers two shuttle services: Yosemite Area Regional Transit System (YARTS) covering Highway 140 year-round and Highway 120 in the summer and the Yosemite Valley Visitor Shuttle which covers a six-mile loop and other season-specific routes.

Due to some of the inherent difficulties of the park, Yosemite chose to focus the YARTS system on a combination of employee and visitor travel. Since employees provide year-round demand for transit, Yosemite engaged the Institute of Transportation Studies (ITS) at the University of California at Davis to conduct an employee survey. The focus of the survey was to examine the feasibility of bus transit during commute hours that would also serve visitors. This research is the foundation for the current YARTS system.

The ITS survey first tried to establish why employees might be reluctant to trying alternative travel modes:

The most frequently cited reason that people were unwilling to consider alternatives to driving alone is the need to fulfill personal, familial, and social obligations either on the way to work, or more typically, after work. This reason is both the first most likely response and the most likely response when added across all three possible responses. Other common responses related to this idea are “Independence, convenience of own car” and “Unable or unwilling to rely on coordinating with others.”

In aggregate though, work schedules are an even more frequently cited reason for not considering an alternative to driving alone. A combined 44% stated that either their work shift was too early or too late, or that their work hours were too variable to allow them to use an alternate to driving alone (Kurani, Turrentine, 2000).

These two statements show a significant difference between employees’ perceptions of why they wouldn’t ride transit — independence and convenience — and what may actually be the limiting factor: work schedule. Those that were willing to try transit cited similar reasons, and also offered solutions:

The fixed schedule and routes of transit service were the foremost concerns of people willing to consider transit. More frequent buses (72%) and stops located close to home (49%) and work (38%) were the things most commonly cited as features that would encourage transit use. Potential transit riders indicate they also would like to see low fares. A third of potential bus

riders said a guaranteed ride home would encourage them to take transit to work (Kurani, Turrentine, 2000).

These statistics provide a laundry list of how to build a successful commuter transit district. Intuitively, one might think that adding flexibility to the work day, such as modifying schedules, would assuage work schedule concerns and be an incentive to ride transit, but the survey found this to be untrue (although the number of the respondents for this portion is quite small (41)).

Changes at the workplace, for example, changes to work hours or work days, the provision of daycare at or near work, paid parking at work, and employer-provided vehicles in the event of the need to make trips for work, do not appear to be productive strategies to encourage transit use — at least among the small number of people who answered this question (Kurani, Turrentine, 2000).

The survey provided valuable data which fed into the requirements of the current YARTS system. More specifically, it helped the transportation planners know that making the bus frequent, inexpensive, and providing convenient bus stops was critical to making YARTS a success.

The YARTS 140 route serves the communities of Merced, Catheys Valley, Mariposa, Midpines, and El Portal. Much of the ridership is park employees (36% for the 2002/2003 operating years). The National Park Service subsidizes up to \$100 of the employee cost. This subsidy means that most National Park Service employees (roughly ½ of the total ridership) ride for free (for example, an employee commuting from Mariposa to his/her office in Yosemite Valley).

The summer-only route on Highway 120 runs from Mono County to the Yosemite Valley floor. This route runs only once a day, in each direction, and due to timing and distances, employment use is light. The bus leaves Mammoth Lakes around 7 am and doesn't return until after 8:30 pm. The trip to the valley floor takes nearly four hours and doesn't leave there until 5 pm to return to Mammoth (Whittington, 2003). This route is very popular with hikers who would prefer to hike point-to-point versus in a loop. It allows them several point-to-point options, including leaving a

car outside the park, riding the bus in, and hiking out to their vehicle. Previously, hikers would need to shuttle two vehicles in order to hike in and out in one direction. Dick Whittington, who works for the Merced County Association of Governments (MCAG), which manages the bus system for the YARTS Joint Powers Authority, claims that, in the 2002 season, roughly 50% of riders used the bus in this fashion — such as parking their vehicle at June Lake and riding YARTS to Tuolumne Meadows (Whittington, 2003). Whittington also mentioned the added benefit of minimizing the risk of a vandalized vehicle: by a human thief or vandal, a bear breaking a window to get at a candy-bar wrapper, or a marmot that has a penchant for eating automobile belts and hoses.



**Photo 10: YARTS Bus**

Marty Nielson, a Supervisory Concessions Management Specialist for Yosemite, claims that the level of YARTS' success has been attributable to a number of contributing factors, including support from several counties, international tourists who are accustomed to taking mass transit, tour packaging with rail lines (like Amtrak), and employee ridership. Specifically regarding employee ridership, the geography of the park and limited in-park housing has resulted in employees commuting long distances.

From Merced to the Valley floor is over a two-hour drive by car, and from Mariposa it is well over an hour (Nielson, 2003). Thus, the mainstay of the service, especially in the wintertime is the employees. For example, from November of 2002 to February of 2003, 44% of all riders were employees. Yosemite also worked extensively with community partners and created the Joint Powers Authority to represent three of the five gateway counties and oversee administrative and legal tasks as one entity. As an incentive, YARTS gives local hotels a commission for selling tickets, and this serves as a travel agent-like network for promoting YARTS (U.S. Department of Transportation Volpe National Transportation Systems Center, 2003). Dick Whittington also adds that using a vendor, like Via Adventures, has reduced costs and made the service stable, since Via Adventures runs a much larger charter bus service, so they have a surplus of backup buses and drivers. The current agreement with Via Adventures is a multi-year contract paid by the mile.

Although Nielson feels that YARTS has been successful, especially for an immature system, it is not without its growing pains. Of the five counties, Tuolumne and Madera counties decided not to participate in YARTS, focusing the system on Mono, Mariposa, and Merced counties. They feared that a successful YARTS would eliminate cars and they would lose business and overnight stays. This has not been the case in other communities, although no systematic research has been conducted (Nielson, 2003). Without the support of two of the five counties, YARTS lacks a cohesive park-wide system. Riders are also fairly spread out during the morning runs, but in the afternoon, the outbound runs exceed capacity. This makes sense, in that family and other obligations are more restrictive in the evening. YARTS is looking to address this by increasing service, but another problem is a lack of consistent funding sources. Since its inception in 2000, YARTS is still looked upon as somewhat of a pilot (U.S. Department of Transportation Volpe National Transportation Systems Center, 2003).

Much more mature than YARTS, the Yosemite Valley Visitor Shuttle (YVVS) has been in operation since the 1970s and has been very successful in reducing congestion and parking problems. In 1995, the first stage of moving towards newer cleaner engines was completed by



upgrading the 1988 buses. To maximize efficiency, a portion of the fleet operates year-round, moving each season to different locations:

- Wawona (May to November)
- Tuolumne Meadows (June to October)
- from Yosemite Valley to the Badger Pass Ski Area (December to April) (National Park Service – News Release, 2001)

Nielson claims that the shuttle is one of the most successful in the National Park Service and that it gives nearly 2 million rides each year. The lack of parking, short distances, frequency of service (6 minute peak headways, 30 minute off-peak), and the simple fact that it is free have all contributed to the shuttle's ubiquitous use. The park plans to continue to promote use of the shuttle by placing a cap on parking in the Valley, building peripheral parking lots (such as at the edge of the park), and increasing the size of the fleet with alternative fuel vehicles. Other future enhancements include space for strollers and backpacking equipment. The current bus fleet has limited storage and something as simple as a two-child stroller or a couple of large backpacks can create obstacles to quick loading and unloading (Nielson, 2003).

Much like Zion, Yosemite visitors are feeling the pain of parking difficulty in Yosemite Valley. Signs indicate full lots and lead visitors to parking areas to promote *park and ride*. This natural link and solution to congestion likely enhances visitor adoption rates of the system.

YARTS and the YVVS are different in distance of travel and age of each of the systems, but both share funding complexities. YARTS, since it is funded from a variety of sources, lacks a single consistent long-term funding source. YVVS is funded through *add-ons* to the concessionaire's (Delaware North) services — effectively a tax on lodging, food, and novelty sales. Delaware North feels that it is at a threshold where the elasticity of demand will hinder sales due to the increased shuttle tax. It's difficult to evaluate this statement, since once a concessionaire has won a contract, they effectively have a monopoly on services and sales within a park — visitors have no other choice. As with YARTS, Yosemite is looking elsewhere for additional funding for YVVS.



**Photo 11: Yosemite Valley Visitor Shuttle**

Although not related directly to mass transit, Yosemite had an experience which offers a valuable lesson when implementing new decisions within the National Parks:

Park officials had created a Restricted Access Plan for closing entrance gates when the number of vehicles entering Yosemite Valley exceeded the available supply of roughly 1,200 parking spaces. In the mid-1990s, peak summer visitation exceeded the trigger point, and the park's gates were closed. With travelers waiting for hours to enter the park and press coverage saying the park had closed, people stopped going to the park... Nearly a decade later, visitors still call local businesses to ask if they will have access to the park, even though visitation has never reached the same peak levels in subsequent years (Cambridge Systematics, 2001).

This example teaches us that even small decisions in the park have lasting impacts on visitors. The park is not a consumer product like a tube of toothpaste whose shelf life is a few weeks. Visiting Yosemite or any other national park is a profound experience for most visitors, and negative feelings due to park policy may stay with a visitor for years.

As far as best practices, Yosemite echoes Zion and Acadia for the baseline of any new transit service:

- Local community involvement and support is crucial. Creating a separate entity, like the Joint Powers Authority, to act as a single administrative body, may save time and streamline the decision making process.
- Meeting employees' needs first, and making them the bread and butter of the system, ensures immediate demand for the transit district.
- Riders, especially employees, are concerned with low cost, schedule frequency, and bus stop location.
- Examining visitor behavior, such as hikers wanting to hike in and out in one direction, also creates an immediate market for the bus system.
- Funding is likely to be a complex issue. Early involvement with Federal Transit Authority, Federal Highway Authority, the concessionaire, gateway communities, and others is also very important.
- Implementation decisions on transit or any other issue in the park may have long-lasting effects. Thorough research and planning is essential.

## 5. Yellowstone — Travel, Research, and Transit

### *Travel in Yellowstone*

Traveling in Yellowstone is unique. As wildlife showcase and host of two-thirds of the world's geysers, even a brief tour of Yellowstone will prove fruitful to a visitor (Yellowstone National Park — State of the Park, 1999). Nearly 3 million people visit Yellowstone every year, and 75% of those visitors enter through one of the park's five entrances and exit another (National Park Service — Alternative Transportation Modes Feasibility Study, 1994). Even a *windshield tour* of the park offers the visitor panoramic views and personal exposure to wildlife. Photo 12 depicts an experience somewhat unique to Yellowstone and quite common with visitors here:



**Photo 12: Bison Jam at the North Entrance**

This *bison jam* may be quite welcome to some visitors — especially if they are in a position to take the photograph — but to many others, the result is simply sitting in the metropolitan-like

congestion they specifically came to get away from. The untamed west which may have attracted a visitor to Yellowstone may seem quite tame, given that in 2002, Yellowstone had 2,983,053 recreational visitors and 3,935,045 total visitors — including employees, contractors, etc. (National Park Service — STATS, 2003). Roughly speaking, that translates into a million automobiles traveling the 329 miles of paved roads of Yellowstone every year, and all of these vehicles are traveling at a maximum speed of 45mph (Yellowstone National Park — Parkwide Road Improvement Plan, 1992).

With so much automobility in Yellowstone, negative externalities are inevitable. Again, in 2002, Yellowstone suffered:

- 591 motor vehicle accidents,
- 2 vehicle related human fatalities (Yellowstone National Park Law Enforcement Statistics, 2003), and
- 79 large mammal fatalities due to motor vehicle accidents (Bear Management, 2003).

Externalities not measured numerically include: loss of visitor and employee time spent in congestion, environmental degradation such as air and water pollution, and poor visitor experience due to delays and lack of parking.

When Brad Traver was Chief Planner for Grand Canyon National Park, he hit the nail on the head with his description of the current problems with visitor experience in large national parks by depicting the roads leading to the Grand Canyon:

...can look like a county fair with cars parked a half mile in each direction (Culbertson, 1997).

Whether such crowding is a simple symptom of the park's popularity or attributable to other park and visitor management difficulties, the net result is that this kind of overcrowding does not comply with, or even address the spirit of the National Parks and Recreation Act:

Under the National Parks and Recreation Act of 1978, the national parks are required to assess their carrying capacity, including their accommodations and parking spaces. Each park must develop a general management plan and set goals for visitors' experiences and the preservation of natural resources (Culbertson, 1997).

The National Parks and Recreation Act and the direct negative externalities of a visitorship in the millions in Yellowstone, especially by personal automobile, beg the question of the feasibility of public transit in the park. The following sections explore research in alternative transportation modes and current transit in Yellowstone.

### *Alternative Modes Research*

The Western Transportation Institute (WTI), at Montana State University in Bozeman, conducted surveys and focus groups to explore attitudes on alternative transportation in Yellowstone. The main focus of the research was to probe respondents about information technology and how it might support alternative vehicle travel in Yellowstone. Although the research is information technology intensive (such as determining what kind of computer interface might be effective in an alternative transit vehicle) many of the questions were targeted at what it would take to get a visitor to adopt bus transit over their personal vehicle in and around the park.

In a previous chapter, *Transit Perceptions*, seven major challenges of mass transit adoption were highlighted:

- uncertainty of bus arrival/departure time,
- frequency,
- necessity of a financial incentive to promote ridership,
- time spent on mass transit versus personal vehicle,
- rider experience, and
- environmental considerations, and

- information/marketing.

Mike Kelly's research at WTI found nearly identical results, especially pertaining to frequency, financial incentive, rider experience, and environmental considerations. These excerpts briefly illustrate his results and their continuity with the literature review:

### Frequency

Also, in order to cater to people's desire to be able to travel at their own pace through the park, the vehicles should run at frequent intervals, have frequent stops, and run in all directions through the park. Half hour intervals were suggested as an appropriate time to wait between shuttles.

One couple said that they took a trip through North Cascades National Park using alternative transportation, and that it was "not an enjoyable experience." They said that the shuttles were spaced too far apart, and they had to rush through the attractions or else wait 2 hours for the next bus.

There was an open-ended question asking what features or amenities would make a tour bus or tram desirable to respondents. The feature mentioned by the most respondents (42%) was convenience, which was characterized as frequent stops, multiple routes, and the ability to get on and off at will. Approximately twenty percent of respondents, though, said that they would not use alternative transportation through Yellowstone (Kelly, 2003).

### Financial Incentive

Cost was another issue of concern. People with several children do not want to pay for five or six seats on a bus. People also do not want to have to pay twice, once to enter the park and once to get on a bus. It was suggested that shuttle bus transportation should be free once you pay to enter the park, or that the entrance fee is waived or reduced for people utilizing alternative transportation. Some people thought that bus tours would be nice, but they need to be cheap and attractive in order for people to use them. As it is now, people pay \$20 and are able to drive their

car through the park for an entire week, so prices for tour buses would need to be competitive (Kelly, 2003).

## Rider Experience

Visibility was also an important issue. It was suggested that the vehicles have large windows or no tops or sides, or perhaps the park should adopt both, so that the people who want air conditioning could ride in vehicles with windows. It was also suggested that the vehicles have a tour guide, someone who can speak about the areas of the park as they pass them, and also to answer peoples' questions (Kelly, 2003).

## Environmental Considerations

One feature that was important to most participants was that the vehicles need to be environmentally friendly and economical, and run on clean fuel, and especially not diesel, which creates unpleasant odors. It was mentioned that Zion National Park has buses which run on propane fuel, which was said to be preferable for two reasons, first that they do not produce as many odors and harmful emissions, but also that the vehicles are very quiet, and do not disrupt the serenity of the park (Kelly, 2003).

In addition, prospective riders had unique requirements that were specific their requirements while traveling in Yellowstone. Mainly, the respondents wanted any alternative mode to also address: stress, comfort/space, and voluntary ridership.

## Stress

...main points emphasized as important to people while visiting Yellowstone. One was that they go to the park to escape the stress of daily life, and do not want to experience stress during their visit. It was said that traffic congestion and full parking lots at the attractions caused stress, and they would like to see these problems alleviated (Kelly, 2003).



## Comfort/space

Comfort and space were also said to be very important. The park is large, and takes several hours to drive through, so people want to have comfortable seats and plenty of leg room. There would also need to be plenty of space for backpacks and bicycles in the vehicles, or else hikers would not want to use them to get to trailheads (Kelly, 2003).

## Voluntary Ridership

Overall, the participants were split about the idea of using public transportation through the park. They all emphasized that if the park did adopt public transportation, it should be voluntary. If the only way to get through the park was public transportation, many visitors would no longer come to the park (Kelly, 2003).

## Conclusion

Each one of these excerpts serve as excellent nuggets of information to help determine both the feasibility of the clean bus tour district and begin to shape what that district would look like. The respondents, or potential riders, clearly had high expectations for any alternative mode in Yellowstone. Such specific requirements and skepticism may appear critical, but these comments are also edifying. The respondents feel passionately about Yellowstone, and they expect that any transit system will enhance their Yellowstone experience.

## *Existing Transit — Mammoth Hot Springs, WY*

Small pockets of transit exist in and around Yellowstone. Niche transit services include large drive-through charter buses, river rafting shuttles, and even a boat at Yellowstone Lake offering tours and a drop-off service for point-to-point kayakers. The one location in Yellowstone that harbors the most seasonally and route consistent forms of mass transit is the park's headquarters

in Mammoth Hot Springs, Wyoming (Mammoth). Mammoth currently supports a park employee shuttle, school bus, airport shuttle, concessionaire tours, and various forms of paratransit.

#### Yellowstone Employee Shuttle

Obtained as a surplus vehicle from the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), the bus in Photo 13 is used as a shuttle from Livingston, Montana, to Mammoth. Stops along U.S. Highway 89 in between include Emigrant, Tom Miner, Corwin, and Gardiner. The cost of the shuttle is \$4 roundtrip from Livingston, with lesser fares of \$2.50, \$1.50, and \$1 for the closer towns, respectively. The shuttle operates Monday through Thursday, focusing on park employees who work four ten-hour shifts; it departs Livingston at 5:30am and returns at 7pm. A handful of riders maintain commercial driving permits, and they alternate driving responsibility. Drivers are paid \$35 a day for the roundtrip.

The shuttle offers tremendous benefits. Tax incentives allow employees to pay for up to \$64 of the monthly cost with pretax earnings. Riders report less fatigue and great savings from avoiding driving the 100+ mile round trip (Burkhardt, 2003). As a side benefit, the shuttle is open to concessionaire employees and to non-consistent riders (such as an occasional commuter or



**Photo 13: Employee Rideshare Shuttle**

someone wanting to drop a car off at a mechanic in Livingston). The costs of the shuttle are shared between the revenue generated by the employees and park funds. When the shuttle is not being used during the day, it is available to the park for tours and conferences. With the exception of the coldest portion of the winter, the bus operates on 20% biodiesel. Daily ridership is approximately 30 employees, and that translates to roughly 20 fewer cars filling the parking lot and adding congestion to U.S. Highway 89.

When asked about continuing operation on Fridays, Willie Burkhardt, a park electrician and de facto manager of the shuttle, responded that they needed about 15 passengers to break even, and Fridays rarely reached that minimum. Another suggestion included adding a loop down to Gardiner later in the morning and earlier in the afternoon to service employees living in Gardiner who work 8-hour days. Burkhardt thought this was feasible, although additional drivers would be needed who worked 8 hour shifts (since the Livingston drivers would be unavailable, as they would be beginning or ending their shifts at their park jobs). He was also uncertain as to whether enough ridership could be maintained to justify the extra trip (Burkhardt, 2003).

#### Airport Shuttle (Karst Stage)

Karst Stage offers airport shuttle service to/from Mammoth and Gallatin Field airport (outside Bozeman, Montana) once a day. The shuttle departs from the Mammoth Hot Springs Hotel every day at 8:15am and the reverse route leaves the airport between 12:30 and 2:30pm, depending on that day's



**Photo 14: Karst Stage Shuttle**

reservation(s). Costs range between \$50-\$150 one-way and \$75-\$195 roundtrip — depending on the number of travelers (Redfield, 2004).

### Gardiner School Bus

5 miles below the park's headquarters in Mammoth sits the Gardiner Public School. The school teaches children from kindergarten through 12<sup>th</sup> grade, and children from Mammoth Hot Springs (Wyoming), Gardiner, Jardine, and out to Tom Miner Basin in Montana attend. The school operates 3 school buses for their 3 routes: Mammoth, Jardine, and the Valley bus (heading north on 89 roughly 20 miles to near Tom Miner Basin). The Mammoth bus is funded by the park and



**Photo 15: School Bus at the North Entrance**

carries approximately 20 children. The Jardine and Valley routes carry roughly 6 and 60 children, respectively, and are both funded by the State of Montana and the County. All buses arrive in the morning just before 8am and depart after school at 3:40pm (Winkle, 2004).

#### Park Concessionaire (Xanterra)

Yellowstone outsources hotel and food services to a third party vendor. Currently, the major vendor, or concessionaire, is Xanterra Parks & Resorts (Xanterra). An example of this relationship would be the Old Faithful Snow Lodge. Yellowstone owns the building and Xanterra provides the services, such as food and overnight stays, to visitors.



**Photo 16: Xanterra Skier Shuttle**

Although Xanterra does not offer a year-round shuttle-type service, their vehicles are constantly moving in and around Yellowstone — offering visitor tours and eventually ending up at their

maintenance facility in Gardiner. In the wintertime, Xanterra offers a host of scheduled tour/transit options. The Prinoth vehicle on tracks in Photo 16 is used to shuttle skiers and snowshoers during the winter from the Mammoth Hot Springs Hotel to the Indian Creek/Golden Gate trailheads. In addition to this ski/snowshoe drop-off service, Xanterra offers a host of wildlife, geothermal, and other interpretive tours via snow coach, snowmobile, and van coach. During non-winter seasons, Xanterra scales back its scheduled tour/transit offerings to just their bus and van coach interpretive tours. There is simply not enough demand to offer visitors transit, because most of them have arrived and plan to tour in their own vehicles. Lorie Stebbins, the Xanterra employee that oversees their transportation services mentioned that they do allow employees on any tour (provided there is empty space) for free and that she has personally heard guests repeatedly request shuttle-type services in addition to the tours they offer. Xanterra does try to accommodate guests who may want to travel point-to-point (say, to shop) versus on tours (such as a geothermal tour), but they are somewhat limited by the routes of their existing tour packages (Stebbins, 2004).

## Paratransit

Dr. Cassello at the University of Pennsylvania defines paratransit as the:

Mode between public and privately owned transportation (Cassello, 2004).

This includes taxis, carpooling, vanpooling, and even hitchhiking. In and around Mammoth, paratransit occurs daily with both park and concessionaire employees carpooling to work. In the summertime, employees often talk of hitchhikers waiting at the park entrance, and most of them are seasonal employees trying to get to work.

## Conclusion

The discussion of these five modes of transit hopefully illustrates one thing: there is a great deal of movement in and around the north entrance of Yellowstone and, more specifically, a heavily traveled route between Mammoth and Gardiner. There are a lot of people going up and down the hill, so to speak. This number will only increase with new developments such as the building of the courthouse in Mammoth Hot Springs and the Heritage and Research Center in Gardiner. Mammoth might be an excellent pilot area to test a shuttle service, especially by combining some of the above functions. However, more research is needed to capture this data. Specifically:

- Examine how many people are traveling along this corridor
  - Differentiate between:
    - visitors
    - park employees
    - concessionaire employees
    - park/concessionaire family
    - contractors
- Survey the above groups to find out
  - What would it take for them to shift modes?
  - Where do their trips begin and end?
- Interview high level decision makers to ascertain what is feasible
- Determine how much money is being spent on all of these forms of transit combined
- Evaluate if it is possible to put a value on an open parking space or one less commuting vehicle, during peak travel times
- Find out the accident rates along this route
- Determine how many people are coming into the park without a vehicle vs. how many have to rent
- Compare/contrast the travel behavior of a tour visitor vs. a visitor traveling in their own vehicle



## 6. Gateway Communities

A clean tour district in Yellowstone must integrate the local gateway communities. The National Park Service's Alternative Transportation Program Strategy Plan (ATPSP) for fiscal years 2002-2006 echoes this thought:

It is clear that alternative transportation systems impact local communities and economies. It is important to demonstrate the ways in which alternative transportation systems add value to the park and community, in addition to improving the visitor's experience. Benefits, in fact, accrue at the local, national and global levels. These benefits include: a stronger local economy, increased health benefits, and improved recreational access, etc. (National Park Service — ATPSP, 2002).

The best way to evaluate local gateway communities, in the context of the clean tour district, is to capture the larger trends of the area as well as interview local community stakeholders. The synthesis of these two data sets will provide insight into the feasibility of the tour district and further acts as a list of requirements to help make such a district locally viable.

### *Area Trends*

The park and its surrounding areas are why people live here. People are drawn to Greater Yellowstone for financial livelihood, recreation, and beauty. Discussed below, the major trends or demographics in Greater Yellowstone are: tremendous population growth, an aging population, and falling wage rates.

### Growth

Greater Yellowstone is a special place to live. Local residents revere the beauty in their backyards and their high quality of life. Residents do disagree on the issue of growth, and most fall into two camps.



One side has a laissez faire attitude: growth is good, it provides jobs, and individuals should decide how and what to do with their own land. The other side feels that growth should be planned, in hopes of maintaining the current landscape and open space.

An example of the more pro-planning side, albeit somewhat controversial, is the Park County Environmental Council (PCEC). PCEC, in conjunction with Montana State University, conducted a study in an attempt to help quantify impacts of projected growth in the borderlands of Yellowstone.

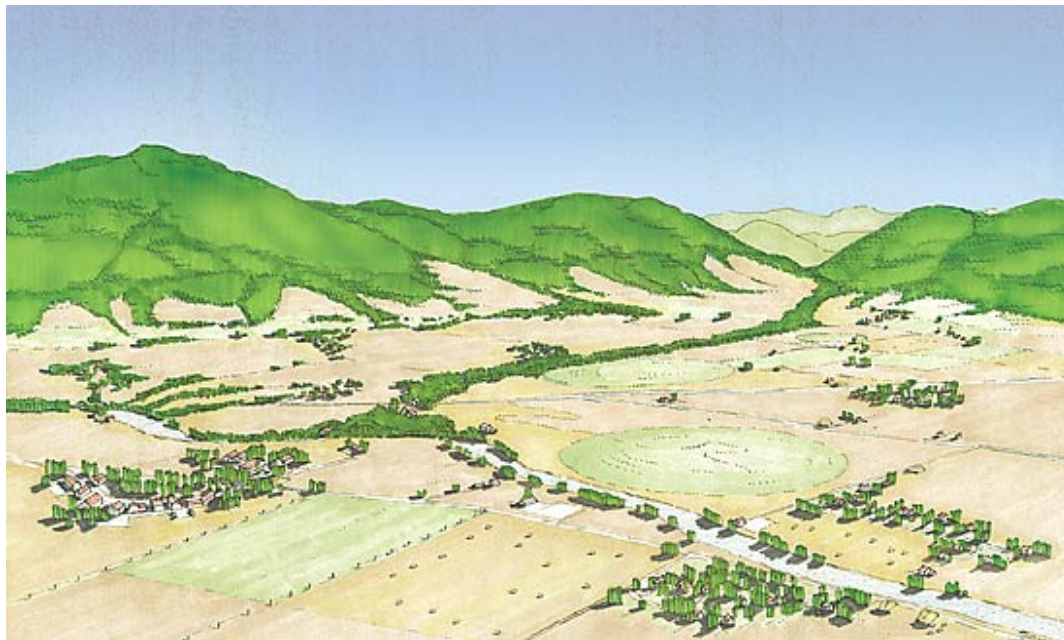
The study, *Paving Over Paradise*, uses modeling software to project growth in Park County — an area bordering the north boundary of the park and encompassing two of the five entrances. The study emphasizes the unique geography of this place:

Park County is a largely rural county in south-central Montana. The lower 48 states' longest free flowing river, the Yellowstone, flows north through nearly the entire length of the county. Montana's highest mountain, Granite Peak, reaches to nearly 13,000 feet in the southern end of the county (Park County Environmental Council, 2001).

and PCEC's fear of subdivision development in the foothills of this unique geography:

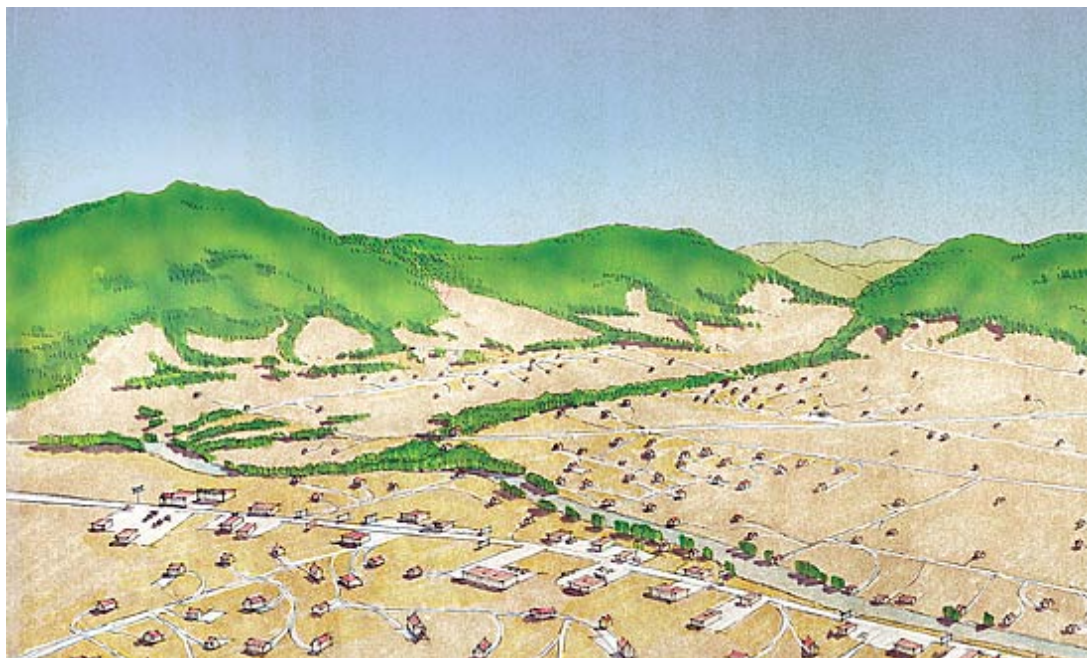
If current trends continue, Paradise Valley, the original gateway to Yellowstone National Park, will one day be a nearly continuous residential subdivision, all the way from Livingston to Gardiner (Park County Environmental Council, 2001).

The main goal of the study was to promote a future of concentrated dense growth while maintaining open spaces, such as in this depiction of a theoretical forecast:



**Figure 3: Theoretical Forecast of Park County I**

versus, what Park County Environmental Council fears — this depiction of conventional suburban sprawl:



**Figure 4: Theoretical Forecast of Park County II**

This general fear of development is not unfounded, as the counties surrounding the park show tremendous population growth. A study completed by the Sonoran Institute and the Yellowstone Business Partnership show a population increase of 61% between 1970 and 2000. This number is impressive, especially compared to the U.S. average of 38% over the same time period (Sonoran Institute, 2003).

Whether residents feel that real estate development in the areas surrounding the park should be left to the free market or governed through a planning process, neither perspective can contest the current and expected growth in these areas.

### Aging Population

The national population, as well as the population of Greater Yellowstone, is getting older.

The population of Greater Yellowstone has aged, as is the case in the nation as a whole. In 2000, 33% of residents were at least 45 years old, compared to only 29% of residents 10 years earlier (Sonoran Institute, 2003).

Further, compared to the national averages, Greater Yellowstone appears to have a greater percentage of seniors. For example, in 2000, 14.9% of Park County's residents were over 65, while the U.S. average was 12.4% (U.S. Census — Quickfacts, 2000). In Greater Yellowstone, this growing segment of older residents is shown not only in the census data depicted above but also economically. Here, 39% of income is characterized as non-labor.

The fastest growing and largest segment of greater Yellowstone's economy is non-labor income, which is a mix of money earned from investments (dividends, interest and rent) and government transfer payments to individuals (mostly retirement related, such as Social Security) (Sonoran Institute, 2003).

It is hardly a stretch to see a majority of this non-labor income dominated by retirees. Such income, and such a high percentage of the total income for the area, clearly represents an older populace.

### Falling Wage Rates

Although the influx of non-labor income has increased per capita income overall, real income has decreased.

Per capita income in Greater Yellowstone has been rising steadily, from \$15,401 in 1970 to \$23,357 in 2000. Note that per capita income is total personal income – including non-labor sources – divided by population. Per capita income is rising largely due to increases in non-labor income.

On the other hand, average earnings per job (in real terms) for the region have been steadily declining from \$27,262 in 1970 to \$23,426 in 2000. This decline is consistent with trends in the three surrounding states, though more severe, and in contrast to upward earnings trends for the nation as a whole (Sonoran Institute, 2003).

This could be a combination of several factors, including: women entering the workforce, a disparity between full-time and part-time employment, and that the pace of population growth has not been shadowed by job growth. Nevertheless, the net result is that for a lower wage earner, Greater Yellowstone is a tough place to make ends meet.

### Conclusion

These demographics — exponential population growth, an aging populace, and falling wage rates — may not seem immediately pertinent to a clean bus transit district. However, it is these major attributes of Greater Yellowstone that help shape the perceptions of its residents. This

data offers background, as it has likely helped shaped gateway community stakeholders' perspectives, both on the surrounding area and on how a tour district might be feasible.

### *Interviews*

From October 2003 through March 2004, I conducted 53 interviews with local gateway community stakeholders, National Park Service employees, and government officials (such as employees of the Federal Transit Authority). This section focuses specifically on the local gateway community stakeholders — representing 45 out of the 53 total interviews. Interviews were held in person and on the phone with residents representing interests in Bozeman, Gardiner, West Yellowstone (Montana), Idaho Falls, Driggs (Idaho), Jackson, and Cody (Wyoming). Examples of the community stakeholders I spoke with include: legislators, tour guides and outfitters, and members of the chambers of commerce. Interviewees were asked to give input on the idea of a clean tour/transit district in Greater Yellowstone. To maximize respondent candor and creativity, questions were open-ended. Regardless of whether the respondents were positive or negative towards the idea of such a district, they were asked further what components they thought would lead to the district's success or failure. For my purposes, the respondents' comments were used to help establish business requirements or suggested components of a clean tour/transit district in Greater Yellowstone. Any paraphrase or direct quote from an interviewee is printed with their express permission. A listing of all of the interviewees and dates of the interviews is printed in Appendix B.

Two types of comments which repeated themselves in the majority of the interviews referred to trains and the current snowmobile debate in the park. For the purposes of a clean bus tour district, these comments are not directly relevant, in that they do not help establish business requirements for such a district. For the purposes of completeness, a brief synopsis of those comments is listed below.

### Trains (including light rail and monorail)

Several interviewees felt that the congestion in the park could be combated with trains (or some type of light/monorail). They preferred the rider experience of trains over buses. One person thought the park experience would be greatly enhanced with steam engine trains.

As described in chapter 2, trains and light/monorail are nearly infeasible in Yellowstone. This is due mostly to cost, lack of flexibility, large ecological footprint, and infrastructure complexities related to Yellowstone's many geothermal features. Still, respondents were very attached to trains and light/monorail. This may be due to positive experiences in urban areas, theme parks, or other national parks where such a system is more feasible.

### Snowmobiles

The recent snowmobile debate came up in most interviews. Of the 45 interviewees, over 30 mentioned snowmobiles. Each felt quite passionate about the issue and either felt that the snowmobiles should be entirely banned from the park or allowed in the park in large numbers. John Kay works for Future Fuels as a Natural Gas Specialist. His thoughts on snowmobiles in Yellowstone were shared by several respondents:

People love the independence of the snow machine. Why don't we integrate alternative fuels into snow machines? We don't want to do away with people's independence (Kay, 2003).

Kay's opinion resounded with others. Many also felt that local economies were built on snowmobile tourism and that those local economies could be devastated by the current debate on snowmobile access in the park.

On the other hand, others expressed their views that snowmobiles were a menace and had no place in any national park. This contingent repeatedly described snowmobiles as loud, smelly, and polluting.

## Tour District Comments and Business Requirements

The remaining comments regarding the tour district mimicked much of the data found in the literature review and addressed by other National Parks. More specifically, responses generally fell into the following ten categories:

- Seniors & People with Disabilities
- Fuels/Energy
- Marketing
- Visitor Experience
- Infrastructure
- Fareless
- Economic Vitality
- Recreational Vehicles (RVs)
- Emotional Attachment to the Park

### Seniors & People with Disabilities

Bob Jones, an Interagency Liaison with the Department of Energy and resident of Idaho Falls, felt that elderly residents and visitors were a critical component to the tour district:

This area has an aging population. These people are very influential and they continuously express their desires by voting at the poles. Keep them engaged with the park (Jones, 2003).

Expanding on this thought, Lisa Ballard from the Western Transportation Institute, in Bozeman, Montana, looked at the tour district as interlacing the needs of the community and visitation of the park. Although this theme repeated itself in other issues, such as fuel infrastructure, she made an especially salient point in talking about healthcare needs for seniors and persons with disabilities. One example she cited is a situation where residents of Bozeman subscribing to

Medicare must travel to West Yellowstone, Montana to go to a Medicare participating dentist. Ballard hoped that the needs of the community, and especially seniors and persons with disabilities, would be addressed, or at least considered, in any tour/transit district (Ballard, 2003).

## Fuels/Energy

Most respondents had positive thoughts on clean fuels. This may be because a number of interviewees were familiar with the Clean Cities Coalition's presence in the area. Greater Yellowstone is unique, in that it is the only non-urban Clean Cities charter.

Linda Milam, of Idaho Falls and the current de facto Clean Cities chair, felt that currently, biodiesel and ethanol were the most viable alternative fuels for the area, since they use the existing infrastructure (Milam, 2003). Other interviewees had opinions about various fuels, such as propane, but the general consensus was that ideally, fuels would be produced locally in a sustainable fashion and as part of a larger energy infrastructure plan. This plan would integrate vehicle fuel needs, as well as energy needs in and around the park, such as heating the Snow Lodge at Old Faithful in the wintertime. An example of this fuel cottage industry might be creating biodiesel out of restaurant waste or methane from dairy waste.

Bob O'Neil from Jackson Lake Lodge would like to see the park choose a single alternative fuel, such as biodiesel, and require that buses and passenger vans use it when driving through the park (O'Neil, 2003).

## Marketing

Jerry Brady from the Post Register and Linda Milam may have unknowingly discussed what the Federal Transit Authority feels is the key to a successful transit district: marketing. Both emphasized the marketing components of uniqueness and creativity in what they would like to see in the clean tour district:



We need a poor man's version of the American Orient Express (Brady, 2003).

Models of the old-style yellow bus are sold in the gift shop. Will a model of the new bus also be available? How about printed on t-shirts, sweatshirts, and caps (Milam, 2003)?

Mr. Brady and Linda Milam see that just as you wouldn't go to Disneyland without riding the Matterhorn, you must create a clean bus district that becomes the thing to do; the thing your kids beg you to take them on; the best way to see Yellowstone.

### Visitor Experience

It is fair to say that most respondents did not want to see conventional transit in the park — in that they didn't want to come to a special place like Yellowstone and ride a conventional commuter bus that they had just seen in the city or town they left behind. Respondents felt that the tour district should offer a unique rider experience, including a specialized look and feel. The old yellow buses were mentioned frequently as *quintessentially Yellowstone*, and many felt that the district would be an excellent platform to expand interpretation opportunities. Diane Renkin, former Xanterra employee and 25-year resident of Gardiner, Montana, felt that the park's attitude toward transportation could directly lead to meeting its vision or mission — to enhance visitor experience in the park. Renkin directed transportation issues for Xanterra for over two decades. In this role, she often found herself behind the wheel of a tour bus interpreting the park for visitors. She claimed that it was very difficult to get people initially out of their cars, but once they were on the bus, they inevitably commented on how the tour was the best money they had spent on their vacation (Renkin, 2004).

### Infrastructure

Bob Richard, owner of Grub Steak Expeditions, had a unique perspective as a tour operator. Richard runs coach tours out of Cody, Wyoming, and he felt that if the park was looking at the feasibility of a tour district, they should first take a look at some of the current issues tour providers are faced with.

There are very few restrooms available, other than at the hotels, that are adequate for a busload of people. For example, picnic areas throughout the park may have 10-20 tables and only one bathroom.

Also, there needs to be a system or some sort of clearinghouse so that buses may better plan their trips. In the summer, it can take between 1 ½ and 2 hours to get a busload of people fed at Old Faithful. This is often due to several busloads of visitors arriving at the same time. If we knew when others were planning to visit the major sites, we might alter our schedules accordingly (Richard, 2003).

It is certainly debatable whether it is the park's responsibility to provide bathroom facilities for buses that often exceed 50 passengers. Nevertheless, by establishing areas with over a dozen picnic tables, it certainly promotes visitation of the park in large groups (or busloads).

## Fareless

As in Zion and Acadia, interviewees stressed that visitors would not want to pay \$20 at the entrance gate and then pay again within the park. The idea of a fareless system seemed to be both a preference and an effective approach to help catalyze ridership. George Erb, from Southern Teton Area Rapid Transit (START), saw a big boost in adoption when they introduced a fareless system in Jackson, Wyoming.

Over the last couple of years, we've been able to make the town shuttle free, and ridership of locals has increased substantially (Erb, 2003).

A fareless system appears to be a desired requirement for the tour district. Although initial implementation of a fareless system may be easy to do, funding issues may arise, as were discussed with Zion, Acadia, and Yosemite.

### Economic Vitality

Comments about capitalizing on the existing alternative fuel infrastructure and utilizing local fuel cottage industries seeped into the larger discussion about the tour district helping to maintain the economic vitality of the region. Interviewees felt that the park brought traffic to local businesses, and they would like to see the tour district increase this activity.

Various entrepreneurs, such as Clyde Seely, a business owner in West Yellowstone, felt skeptical about the tour district. He hoped, however, that if the district came to fruition it would promote ease of access for tourists who did not want to drive their own cars. These tourists could leave their cars, take day trips into the park, and still enjoy their evenings in gateway communities such as West Yellowstone. His skepticism about the tour district, however, stemmed from his feeling that since most people are already traveling in their own car, they may not want to get out of it and into a bus to sit next to a stranger or an unruly child (Seely, 2003).

Fran VanHouten, from RainMaker Coaching and Marketing in Jackson, Wyoming, captured the thoughts of many of the interviewees, that the tour district was the key to promoting economic vitality and collaboration in the region.

Imagine if the "tour" system could be used as a means for extending the reach of the hospitality industry. If hotel operators in each of the gateway communities were to partner with hotel operators in the other communities, a guest may be able to make one phone call and define a complete tour of the parks and public lands, with their housing provided by a series of collaborating hotels. I think the potential exists for a "tour" system to make more of one's visit to the region than what may be experienced by most visitors currently (VanHouten, 2004).

Many of the interviews' comments reflected what it would take for visitors to adopt the tour district. For community stakeholders themselves to embrace the district, it is clear that they want the district to directly promote the economic vitality of Greater Yellowstone.

### Recreational Vehicles (RVs)

Interviewees generally felt negatively about motor homes or RVs. One respondent felt that it was ridiculous that in commercial circumstances, a driver of a vehicle of a similar weight and size would need training, testing, and licensing to drive such a vehicle, yet anyone with a credit card and standard passenger vehicle license could rent or buy such a vehicle and drive it through Yellowstone. Yellowstone has miles of narrow roads with incredible views. In these areas, the road is secondary to the view. To accommodate a growing number of larger vehicles (especially RVs) entering the park, Yellowstone is evaluating widening many of these roads, even though vehicles over 30 feet in length represent only 2% of visitors' vehicles (Yellowstone National Park — Transportation Study Dunraven Road, 1997). Doug Madsen, an Outdoor Recreation Planner and lead on planning and compliance for roads projects in Yellowstone, feels that the roads in the park should reflect the variety of travel modes that visitors choose in which to experience the park.

I feel that we should have a variety of park roads in Yellowstone. Some roads should be wide for larger vehicles and others more primitive and narrow to reflect the expectations of various visitors throughout the park. One approach might be to make a corridor through the park that hits many of the main features that people are coming to see. This corridor would accommodate most types of vehicles including larger recreational vehicles and tour buses. A good candidate for this route would be from Cody to West Yellowstone and including the large tourist attractions of Old Faithful and Yellowstone Lake. Most of these roads can already accommodate the larger vehicles, and this corridor would allow travel through the park utilizing two entrances. Other more narrow roads in the park could be maintained for a different type of visitor use, such as wolf watching and tent camping (Madsen, 2004).

Madsen highlights the fact that different types of visitors want to experience the park in different ways. Some may want to experience the park in an RV so that they may have all of the creature comforts of home, while others may feel that RVs are slow, cumbersome, and obstruct views of those following in smaller vehicles. Just as Madsen suggests, a combination of policies may offer the best solution.

Recreational vehicles (RVs) may seem unrelated to a discussion about a tour or transit district, but the size of RVs and their road infrastructure needs are similar to buses that might be used in a tour district.

### Emotional Attachment to the Park

Clearly the above comments show the mixed emotions and skepticism about a tour district in the park. This skepticism is born out of people's love for the park. Nearly every interviewee mentioned their strong emotional attachment to the park and the surrounding area. Many mentioned that each visit to the park is alive, different, and that they never tire of exploring it. This heartfelt appreciation is one of the major components that must be addressed in any tour district where the transportation mode will shape the visitor's experience. Ideally, planners will keep this in mind and use the tour district as a way to enhance visitor experience.

### *Synthesis*

By combining the Greater Yellowstone demographics and gateway community interviews, clear patterns emerge. Residents both love this area and feel territorial towards how it should develop over time. The residents' emotional and financial attachment, that this is their Park, resonates in their desire to have the park administration create more business opportunities (for example, the clean bus tour district driving business to their storefronts) while keeping the park pristine. An aging population will impact transportation needs in communities and the way in which this population wants to experience the park. Regardless of whether residents are positive, negative,

or skeptical toward the feasibility of a clean bus tour district, they agree on the need for such a district to be integrated into the transportation needs of the region as a whole. Although generally comments fell into the categories above, the tour district discussion did evoke some interesting twists which are worth noting.

Bill Guheen, the manager for the shuttle service for rafting trips from Jackson Lake Lodge, mentioned visitor frustration with mass transit. The lodge offers shuttle service from the airport and into downtown Jackson to their visitors and employees. The roundtrip costs are \$50 to the airport and \$70 to downtown.

Visitors trying to use mass transit suffer from sticker shock, especially if they just multiplied these numbers by 2 adults and 3 kids. Oftentimes, visitors arrive at the lodge via the shuttle and ask to be taken back to the airport so they can rent a car (Guheen, 2003).

Greg Worthen, from Powder River Transportation, felt that bus tours/transit would help mitigate congestion and air quality issues in the park. He suggests that 55 people will fit on a 45 foot motor coach. At an estimation of four persons per vehicle, one bus tour would take at least 14 cars off the road. Not only would the bus help with pollution, noise, and congestion, guided coach tours offer a superior educational experience over driving in a private vehicle (Worthen, 2004).

Both of these sets of comments show the challenges and also opportunities of a clean tour district in Yellowstone. The district must offer an unforgettable park experience, as well as being environmentally friendly, well planned, help boost local area economics, and address a growing elderly population.

## 7. Alternative Fuels

One of the major components of the clean bus tour district is alternative fuels. Pockets of alternative fuel leadership currently exist in Greater Yellowstone, especially in the areas of research, infrastructure, and community involvement.

### *Research*

Although much of Greater Yellowstone is seeing exponential population increases, most of the land remains rural. For example, the 2000 Census estimated Wyoming's population to be 494,423 — not very high for an area encompassing over 97,000 square miles (U.S. Census Bureau, 2001). This rural area also has long distances between cities and towns and dramatic temperature changes between seasons. The geography and weather combined have led to an area which is highly dependent on conventional energy sources for industry, transportation, and even simple home heating in the winter.

In response to the high transportation costs and pollution associated with delivering fuel to various parts of the frontier, entrepreneurs sprinkled throughout Greater Yellowstone have been experimenting with local alternative fuel production as a cottage industry.

Richard Lewis, from Recovered Energy Inc. in Idaho, recently proposed to build a waste recovery plant in lieu of continuing to fill Bannock County Landfill in Idaho.

Lewis, of Recovered Energy Inc., based in Pocatello, said the city's waste could be converted into gas which could power an ethanol plant and a variety of other useful products through a process called plasma gasification (O'Connell, Idaho State Journal, 2004).

Lewis further claims that the plant will produce 100 local high-paying jobs and would be much more environmentally friendly than conventional *waste to energy* plants which generate electricity through a combustion process (Recovered Energy, 2004).

Also in Idaho, Dr. Dennis Keiser from Intrepid Technologies announced their alternative fuels specialization to investors:

We are also making substantial progress in transitioning from a broad engineering services firm to a focused biofuels — particularly biodiesel, methane and ethanol — production company (Soy Daily, 2003).

Dr. Keiser is looking to open a 40 million gallon Ethanol production plant in southern Idaho:

The Newdale plant would convert straw from wheat and barley - abundant in eastern Idaho - into Ethanol, which is used as an additive for automobile fuel (Prairie Star, 2003).

Patrick Mazza, researcher and author of *Rising to the Challenge: Northwest's Clean Energy Leadership*, is convinced that the north and west areas surrounding Greater Yellowstone are uniquely positioned to harvest alternative fuels from their vast farmlands and significant restaurant waste streams:

Northwest Opportunities – University of Idaho researchers, investigating biodiesel since 1979... have identified yellow mustard, canola and rapeseed as biodiesel feedstock crops that are particularly well adapted to the dry, sunny interior Northwest. Idaho and Montana are top growing areas for these oil crops. And mustard rotates with wheat, including dry land varieties. Biodiesel from these crops is not currently cost competitive with petrodiesel, but co-products such as mustard based pesticide could make it economically viable. And mustard based biodiesel is already cheaper than the commonly used soy-based biodiesel. The Northwest also has abundant supplies of used cooking oil. Idaho researchers worked with J.R. Simplot in a successful pilot project to convert french fry oil into biodiesel (Mazza, 2002).

This small example of existing research on biofuels in Greater Yellowstone suggests possible synergies with energy production, maintenance of open space through agricultural fuel production, and economic vitality. Ideally, all of these are simply the added benefits to environmental sustainability — the immediate goal of transitioning to alternative fuels.



## *Existing Infrastructure*

Yellowstone itself has experimented with alternative fuels for the past several years. Not only have both Yellowstone and Grand Teton National Parks been active as advisors to the Clean Cities Coalition, they have both actively promoted alternative fuel use through an umbrella program called the *Greening of Yellowstone*.

John Sacklin, Chief of Planning, describes the intent of the *Greening of Yellowstone* program:

Under the “Greening of Yellowstone” initiative, through which Yellowstone is seeking ways to accomplish its mission and tasks in more sustainable ways, the park has been a leader in use of alternative fuels in the parks. For example, Yellowstone has had a  $\frac{3}{4}$  ton diesel pick-up truck operating on 100% biodiesel for several years. Because of the success of that program, a portion of Yellowstone’s heavy truck fleet was converted to a 20% biodiesel blend in 2001, and the balance of the heavy truck fleet will be operating on a biodiesel blend in 2002. Grand Teton has been equally active in alternative fuels and has switched all of its diesel to biodiesel (20% blend in the spring, summer, and fall and 10% in the winter). Ethanol was introduced into the parks’ administrative fleet several years ago and in 2001 was made available for sale at park service stations. The parks are working with the Propane Energy Research Council on propane applications for buildings and vehicles (Sacklin, 2002).



**Photo 17: ¾ Ton Biodiesel Truck**

Since the inception of these initiatives, the park has continued to expand alternative fuel use. In Gardiner, Montana, the park maintains a 15,000 gallon biodiesel tank. The Park's fuel provider, Story Distributing Co, mixes or *splash blends* 20% biodiesel with petrodiesel before distributing it to the 10 administrative fuel stations throughout the park. A similar situation occurs with ethanol blending (with gasoline) at a holding station in Corwin Springs, Montana. Yellowstone hopes to make these cleaner fuels, such as E85 (85% ethanol and 15% gasoline) available to visitors beginning in the spring of 2005.



**Photo 18: E-85 Ethanol/Unleaded Tank**

Jim Evanoff, Management Assistant in the Maintenance division, hopes to see a corridor of biodiesel and ethanol availability throughout the park connecting other lesser-known uses of alternative fuels in Greater Yellowstone, such as the testing of ethanol and biodiesel use in summer vehicles at Jackson Hole Mountain Resort in Jackson, Wyoming. Evanoff feels that Yellowstone's success has also reached far beyond the park boundaries:

This movement has had both regional and national effects. Because of Yellowstone's successes, 37 other parks have converted to alternative fuels. In Greater Yellowstone, gateway communities are following the lead. For example, West Yellowstone recently opened a public biodiesel station, and the public transit system in Jackson is also using biodiesel (Evanoff, 2004).

The park currently consumes 30,000 gallons of biodiesel (in the form of canola oil) a year. This number will only grow, considering that the 8 wintertime snow groomers in isolation consume roughly 56,000 gallons of diesel per season. Evanoff also praises the ease of using canola oil as a fuel, since it is renewable and non-toxic. Additionally, EPA storage requirements for canola oil are much less stringent than petrodiesel (Evanoff, 2004).

### *Clean Cities*

Much of the momentum, in Greater Yellowstone and directly in the park, has been both inspired and captured by the Clean Cities Coalition. Greater Yellowstone gained the Clean Cities designation in September of 2002, and it is the only non-urban area to receive the designation. Jon Lear, from Ruby Mountain, Inc. and who helped champion the designation, comments on the simple mission of Clean Cities:

We want to reduce the level of emissions. As visitor numbers increase, we can keep the emissions down by jointly running buses and other vehicles both inside and outside the park on alternative fuels (Lear, 2004).

*For a more comprehensive of Clean Cities' programs, please visit their website:*

*[www.ccities.doe.gov](http://www.ccities.doe.gov)*

Out of the local Clean Cities initiative, two major projects have evolved: the New Yellow Bus and Greater Yellowstone WORKS.

## New Yellow Bus

The Idaho National Engineering and Environmental Laboratory (INEEL), in conjunction with the National Park Service and other partners (including: ASG Renaissance, Clean Cities Coalition, Heart International, Hadley Products, and Ruby Mountain) has developed



**Photo 19: New Yellow Bus on Snow Tracks**

a modern prototype bus that combines the styling of the classic Yellowstone Yellow Buses with clean fuels and new technologies.

On August 25, in connection with National Parks Day, the Idaho National Engineering and Environmental Laboratory unveiled what may become the national park shuttle bus of the future. The 18 to 32 passenger vehicle uses alternative fuel and has a low floor so steps are not required for entry. The bus, which complies with the Americans With Disabilities Act, features an entry ramp for wheelchairs. It will also have optional tracks that can be used to travel over snow, and to give passengers better visibility, the vehicle has a retractable roof and theater-style seating, which slopes 1.8 degrees to the front.

The prototype was created as part of a collaborative effort to protect the park's environment and decrease dependence on foreign oil. When manufactured, the vehicle is expected to have several engine options that will allow the use of alternative fuels such as natural gas, propane, ethanol, and biodiesel. INEEL says the shuttle will be priced about 45% below current low-floor buses (Engineering Times, 2003).



**Photo 20: New Yellow Bus at the Grand Tetons**

The prototype has been built and is currently being field tested over the 2003/2004 winter in Yellowstone. This first prototype has successfully completed the conversion to tracks for over-snow travel and runs on a diesel engine using B20 or 20% biodiesel (canola oil) and 80% petrodiesel. The uniqueness of this bus, its legacy to the older Yellow Buses, and its modern amenities make it a clear candidate for use in a clean bus transit district in Yellowstone.

## Greater Yellowstone WORKS

In 2000, INEEL drafted a proposal under the working name of Greater Yellowstone WORKS (GYW). The purpose of GYW was to create a framework for regional cooperation on areas such as energy and transportation. A major goal of GYW was to provide regional stakeholders the information and tools to better coordinate their efforts and improve the results of major investments in infrastructure.

Basil Barna, founder of Wilderness Systems and Technologies, helped spearhead the GYW project when he worked at the Idaho National Engineering and Environmental Laboratory (INEEL). Barna offers a simple example which helps illustrate a potential opportunity for GYW, and it lies under the ground in Jackson, Wyoming. Over the last few years, major construction at the Teton Village resort near Jackson, Wyoming has required burying huge tanks of propane underground as an energy supply for heating, cooking, and other purposes. Three of the new hotels in Teton Village use an average of over 30 million BTU's of energy per hour in the winter. Barna suggests that by looking at these types of developments as part of an integrated energy system in the Greater Yellowstone, synergies may evolve which would help promote the economic and environmental sustainability of the entire region.

For example, if Teton Village is using propane for heat/energy, could propane also be a useful local transportation fuel? Alternatively, could expanded coordination result in alternative or more efficient energy systems (Barna, 2004)?

The GYWORKS project attempted to examine these types of questions. This work has now folded back into Clean Cities, but begs more attention and funding as a crucial task in pinpointing the energy infrastructure for an ever-expanding region.

## *Conclusion*

The idea of a clean bus transit district may seem novel, but the efforts above show that a backbone to the district already exists. Alternative fuels are available in and around the park. Research in new bus technologies shows large strides in meeting user requirements and offering riders a unique experience. And ultimately, organizations, like the Clean Cities Coalition, show dedication to promoting alternative fuels, economic vitality, and environmental sustainability in Greater Yellowstone.

## 8. Recommendations

The purpose of this report has been to offer a preliminary opinion on the feasibility of a clean bus tour district in Yellowstone. Yes, it is feasible and in many ways desirable. However, there are several caveats, namely:

- Conventional bus transit, a web of interconnected routes throughout the park, is not currently feasible. This is especially true given the unlikelihood that the park would make such a system mandatory (like Zion). Further, Yellowstone's five entrances/exits and long distances between attractions would require a huge financial investment in infrastructure (100s of buses, maintenance facilities, etc.).
- Focusing on smaller niche markets, such as the interpretive tours offered by the Yellowstone Association in the Lamar Valley using the old Yellow Buses, would not substantially alleviate congestion. That said, these smaller markets could greatly help in testing prototype vehicles and boost initial visitor adoption of transit and tours.
- Unlike Acadia and Zion National Parks, visitors are generally not feeling the pain of full parking lots which is a big incentive to get them out of their cars and onto transit.
- A transit system without restrictions on automobiles may lack ridership. A combination of tours/transit plus park policies might help. For example, in Acadia National Park, recreational vehicles (RVs) often park peripherally and use transit to access the park. Something similar, at least for certain roads in Yellowstone might be effective, if combined with bus tours of the areas. Another option would be to limit an isolated area like one of the Canyon Rim Drives to mass transit only, by having visitors park at Canyon Village and ride buses along the North Rim Drive and looping back to the village.

Another policy combination alternative might be to offer visitors an incentive to ride transit, either overtly or passively. For example, having visitors pay for parking would elevate awareness of the cost of driving and the park's maintenance costs for providing access to personal vehicles as well as offering an incentive to use transit.



## Low Hanging Fruit

Some immediate steps could be taken to improve transit, especially in the Mammoth Hot Springs Area. A casual carpool or *slug line* could be created for the corridor between Mammoth and Gardiner, Montana by simply installing signs suggesting it at the north entrance station in Gardiner and at the Post Office in Mammoth. An established protocol would likely help latent carpoolers, especially Mammoth area employees, leave their vehicles at home and adopt this simple paratransit system. This system could be supplemented by the many administrative vehicles traveling between Mammoth and Gardiner. One example is a ski shuttle run by Xanterra to the Indian Creek trailhead. The shuttle, a snow coach on rubber tracks (shown in Photo 19) that can travel both on the road and over snow, starts in Gardiner at 8am, arrives in Mammoth by roughly 8:15 and returns from Mammoth to Gardiner at roughly 5pm. This shuttle deadheads between Mammoth and Gardiner empty (passenger-less) everyday from early December to mid-March.

The Monday through Thursday Livingston employee shuttle could add an incremental driver who worked 8-hour shifts (versus the 10-hour shifts the current drivers work) to add an additional loop between Gardiner and Mammoth. This would offer employees living in Gardiner two transit time options in the morning (arriving at Mammoth headquarters just before 7 and 8am) and two times in the afternoon (departing headquarters at roughly 4:30 and 5:30pm).

Like Acadia National Park, a *Car Free Travel Guide to Yellowstone* would be inexpensive to create and a step in the right direction towards giving visitors options in how they view the park. Even if the current mass transit connections between airports, gateway communities, and throughout the park are scarce, this compilation would be a valuable resource for visitors and an excellent exercise in bringing together the various transit organizations throughout Greater Yellowstone. This tool would especially help international visitors who often *expect* to ride transit when planning their trip to Yellowstone. This would be an excellent

research/implementation project for a local university, especially in conjunction with a transportation research body such as the Western Transportation Institute.

The *Car Free Travel Guide* could go hand in hand with an effort to showcase clean fuel use in Greater Yellowstone. One marketing idea might be to create a *Clean Corridor* in Greater Yellowstone that would advertise both mass transit options and locations where visitors and locals could obtain alternative fuels for their vehicles. This marketing effort would easily dovetail into the Clean Cities mission by promoting education, adoption, and cross-pollination between possibly isolated environmental endeavors.

The current momentum of the prototype of the New Yellow Bus would be an excellent platform to introduce visitors to transit in the park. The new vehicle has created quite a stir, both locally and nationally, and this excitement should be channeled into pilots or testing of tours in and around Yellowstone.

#### Further Research Questions

This report was limited in scope by a six month time constraint. A researcher continuing with this work should be able to use this document to get up to speed and establish a foundation for further research. Many of the people interviewed in gateway communities, administrative offices, and in other parks, are excellent resources; they are also the people who can get things done in Greater Yellowstone. Questions and areas that need further research include:

- Is Yellowstone committed to keeping transit voluntary, or would a combination of policies (such as mandating transit on selected areas like North Canyon Rim Drive) be feasible?
- How are visitors, employees, and employee family members traveling in the park? Are there clearly established patterns, both by time and route? What is the level of willingness to adopt transit? What are the key components to transit that would drive

adoption? These questions would be best addressed through a survey to obtain quantitative and qualitative data.

- How would such a tour district be funded? In the case studies, all three of the other national parks described funding woes, but it did not come up in the gateway community interviews. A mixture of options, including federal funding, is certainly feasible to get the tour district off of the ground, but the longer-term maintenance dollars will be harder to find, and establishing this consistent funding source will be a task unto itself.
- Other parks have used the United Parcel Service (UPS) brown van model of using new vehicles in high-use areas (such as cities) for a period of time and then shifting these assets out to lower-use areas (such as in rural settings) to both extend their service area and the life of the vehicles. Yellowstone may have an opportunity to duplicate this model, even as the park shifts between seasons, by moving assets from use in Yellowstone in the summer to use by a local ski resort in the winter.
- Where have other parks been successful in marketing and educating the public on environmentally friendly projects or behavior? If these projects were transit oriented, did they directly boost ridership? I have suggested that the New Yellow Bus project brand itself with a pro-environmental catch phrase, such as *The Yellow Bus That's Green*®. Linda Milam has also talked about the availability of the models of the old Yellow Buses in the gift shop. Clever marketing, and even the making of toys, may prove to be effective ways in which to increase ridership.

## Crucial Components

This report offers an outline of the crucial components and activities that will give a clean bus tour district the best chance of success. Simple attributes like low floors on buses to accommodate seniors and persons with disabilities and leasing bus driving and maintenance services may seem obvious, but the entire list of attributes is daunting. For a comprehensive listing of these components and suggestions, effectively the dos and don'ts of building a clean bus tour district in Yellowstone, please see Appendix A.

## Conclusion

The inception of a clean bus tour district in Yellowstone will encounter challenges in ridership, financing, and acceptance in local gateway communities. If it is well planned and includes input from all stakeholders, it could be quite successful and have a substantial impact on improving congestion, reducing wildlife fatalities, promoting local economic vitality, and enhancing visitor experience. Appendix A may contain a long laundry list of crucial components for success, but one that is not listed that may be the most difficult is building a clean bus district that reflects peoples' passion for Yellowstone. In the gateway community interviews, the single resounding consensus was peoples' strong emotional attachment to the park. It may be nearly impossible to directly address such an abstract requirement. One pragmatic way may be to begin slow and on a small scale so that visitors are given time to acclimate to the new system and so that the initial investment manageable. This approach will foster creativity and an opportunity for adaptive management as the tour district matures.

## **Appendix A: Tour District Components**

The list below brings together a laundry list of dos and don'ts for a potential clean bus tour district in Yellowstone. These best practices are gleaned from each of the chapters and offer learnings from the literature review, other national parks, gateway community interviews, and current research and infrastructure in alternative fuels in Greater Yellowstone. This list could have been categorized in many ways. For simplicity, I have kept it as a list. The list is roughly organized from the components which are the most tangible, such as using buses which are ADA compliant, to more abstract, such as having the district address people's emotional attachment to the park.

- Buses are the most appropriate vehicle for the district over other forms of transit, such as light rail.
- Bus stops should have real-time arrival information.
- Buses should reflect the unique identity of the park, such as the old Yellow Buses.
- Low floors and raised platforms offer speed of boarding and ADA compliance.
- Design bus space for comfort, wheelchairs, strollers and large backcountry backpacks.
- Farelessness will increase ridership and the speed of boarding.
- Two doors will improve boarding speed.
- Large windows, a removable top, and/or a live interpreter would offer an experience that could not be had in a car.
- Trailers increase capacity without increasing labor costs.
- OEM vehicles are easier to maintain (especially to find parts), resell, and negotiate pricing.
- If it is a true transit district, headways should not exceed 30 minutes between buses.
- True transit needs frequent stops, multiple routes, and the ability to get on and off at will.
- Certain geographies, like canyons with one way in and out, work well for pure transit.

- Use existing meeting places, like restaurants and hotels, as stops versus building staging areas. Businesses are normally happy to give up their parking in exchange for increased traffic to their storefronts.
- Mandatory use in isolated areas will increase ridership.
- The park should own the buses and other physical components of the system (e.g. maintenance yards) and hire a vendor to manage the service (hire/train drivers, maintain the vehicles, etc.) to reduce costs.
- Designers of the system should live onsite, to promote buy-in and gather ad hoc employee input.
- Show visitors the need to use the system, such as by using changeable message signs to say that parking lots are full.
- Build a website to allow prospective visitors to plan their trips using mass transit.
- The district should use alternative fuels, especially, in the immediate term, the existing infrastructure of biodiesel and ethanol.
- Fuel uses in and around the park, such as the 56,000 gallons of diesel consumed by groomers in the winter should be reflected in fuel choices for the vehicles, both for environmental and price negotiation reasons.
- Alternative fuels produced locally should also be considered, especially for low transportation costs and to support the local communities.
- There must be a financial incentive to ride. If people are using the district to commute, there must be a clear positive distinction between the cost to drive and the cost to ride.
- Using local businesses as park ambassadors, with training and signage at their doors, would help promote word of mouth marketing and community buy-in of the system
- If tickets are sold, giving local businesses a commission and using them as travel agents will help sell the district.
- Secure initial funding for asset purchase as well as ongoing maintenance dollars.
- If the district will be partially funded from entry fees, the trends of National Park Pass usage should be evaluated to project a possible decrease in income to the district.
- Creative funding options like federal incentives to get people to work, discounted passes purchased by local employers to offer as a benefit to their employees, other federal

entities which might have large sums of money allocated towards transportation should be examined. For example, the Department of Health and Human Services has 5 of its \$100 billion budget allocated to transportation, even though they do not consider themselves a transit agency.

- Advertise the district as an environmentally clean alternative.
- Market the district (even by making toy buses).
- If employees are using the district to commute, make sure the commute portion is very effective, since it could be the bread and butter of the district in the off-season.
- The biggest motivators for employees to ride transit are frequency of buses and stops and the proximity of stops to work and home (surprisingly, these are larger motivators than altering work schedules).
- Involve gateway communities, employees, visitors, bus companies, tour vendors, the park concessionaire, the State Department of Transportation, Federal Highway Administration, and any others as early as possible.
- The number of buses needed in the winter is a fraction of what would be necessary in the summer. Surplus vehicles could move seasonally to meet demand elsewhere (such as at a ski resort in the winter).
- Creating a separate entity to run the service may streamline the decision making process and allow the district to transcend state/county/park/forest boundaries.
- Try to capture visitor behavior, such as hikers wanting to hike in and out in one direction (point-to-point). This may offer an immediate market for the district.
- The sound of the buses, like diesel motors, should be considered as part of the visitor experience (and should also be considered as a factor in fuel choice).
- If a district is established, maintain before and after vehicle accident and wildlife collision rates, air quality statistics, and other quantifiable data to see results and also to use as support data when applying for additional funding to expand the service.
- The district must accommodate a growing number of seniors in the area. Examples might include using a larger font size when printing tour/transit timetables and minimizing steps on platforms and buses.
- RV owners might be a direct *park and ride* market for tours.

- The district may require additional visitor infrastructure, such as more bathrooms, picnic areas, or simply benches for someone to sit on to wait for the next bus.
- Timing should be considered, such as if a busload of visitors should be dropped off at lunchtime at Old Faithful to compete with the existing crowds.
- The district should mirror the usage intent of the roads in the park. Some roads are appropriate for buses, others not.
- Add a transportation component to the visitor satisfaction survey so that visitor perception of the district could be tracked over subsequent years.
- Personal automobiles dominate the park. The district will have to be incredibly compelling to compete with this mode by offering a very unique experience.
- Current behavioral issues, like 75% of visitors entering one entranceway and exiting another, must be considered.
- Immediate applications should include areas where there is a clear congestion problem, such as at Old Faithful or summer employee parking in Mammoth.
- Park decisions have a long shelf life (such as the ‘closing’ of Yosemite Valley). Plan on long term decisions.
- People’s emotional attachment to the park must be addressed in some way. One option would be to start small and slow and grow over time. Allow people time to adapt.



## Appendix B: Interviews

Name	Organization	Interview Date
Albert, Steve	Western Transportation Institute	10/27/2003
Anderson, Michael	Department of Energy	10/15/2003
Ballard, Lisa	Western Transportation Institute	10/27/2003
Barna, Basil	Wilderness Systems and Technologies	10/16/2003
Bobinchock, Len	Acadia National Park	10/9/2003
Bohrer, Jason	U.S. Senate, Larry Craig	10/16/2003
Brady, Jerry	Post Register	10/15/2003
Brown, Janice	Yellowstone Business Partnership	10/20/2003
Burkhardt, Willie	Yellowstone National Park	12/6/2003
Carsley, Scott	Alpen Guides	10/20/2003
Chastain, Shirley	Idaho Falls Downtown Development Council	10/16/2003
Christenson, Louis	City of Driggs	10/30/2003
Dunworth, Leigh Anne	Yellowstone National Park	3/1/2004
Erb, George	Southern Teton Area Rapid Transit	10/30/2003
Evanoff, Jim	Yellowstone National Park	2/25/2003
Guheen, Bill	Jackson Lake Lodge	10/30/2003
Harrington, Donovan	Teton Stage Lines	10/16/2003
Huddleston, Leslie	U.S. Senate, Mike Crapo	10/15/2003
Jones, Bob	Department of Energy	10/15/2003
Jones, Bob	Parks Transportation Inc.	10/2/2003
Jorgenson, Larry	Teton County Board of Commissioners	10/30/2003
Kack, David	Western Transportation Institute	10/27/2003
Karinen, Jan	EITC Foundation	10/16/2003
Kay, John	Future Fuels	10/16/2003
Kelly, Mike	Western Transportation Institute	10/27/2003
Klingler, Kerry	Idaho National Engineering and Environmental Laboratory	10/15/2003
Lear, Jon	Ruby Mountain Consulting	1/15/2004
Lopez, Eddie	Zion National Park	10/29/2003
Madsen, Doug	Yellowstone National Park	3/1/2004
McGeachin, Janice	Idaho State Representative	10/16/2003
Milam, Linda	City of Idaho Falls	10/15/2003
Nielson, Marty	Yosemite National Park	10/31/2003
O'Neil, Bob	Jackson Lake Lodge	10/30/2003
Paddleford, Bill	Teton County Board of Commissioners	10/30/2003
Plothow, Roger	Post Register	10/15/2003
Redfield, Tina	Karst Stage	2/10/2004

Renkin, Diane	formerly Xanterra	2/23/2003
Richard, Bob	Grub Steak Expeditions	2/25/2004
Roh, Sharon	City of Idaho Falls	10/15/2003
Rosenfeld, Gary	Delaware North (Yosemite)	12/8/2003
Sacklin, John	Yellowstone National Park	1/6/2004
Scott, Kirk	Parks Transportation Inc.	10/6/2003
Seely, Clyde	Three Bears Lodge	10/17/2003
Seymour, Lynn	Targhee Regional Public Transit Authority	10/15/2003
Sier, Elizabeth	Federal Transit Authority (Seattle)	11/17/2003
Stebbins, Lorie	Xanterra	2/11/2004
VanHouten, Fran	RainMaker Coaching & Marketing	3/2/2004
Wackerly, Michael	Southern Teton Area Rapid Transit	10/30/2003
West, Derek	Bonneville Metropolitan Planning Organization	10/15/2003
Whittlesey, Lee	Yellowstone National Park	12/6/2003
Whittington, Dick	Joint Powers Authority	12/23/2003
Winkle, Debbie	Gardiner Public School	2/10/2004
Worthen, Greg	Powder River Transport	3/2/2004

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